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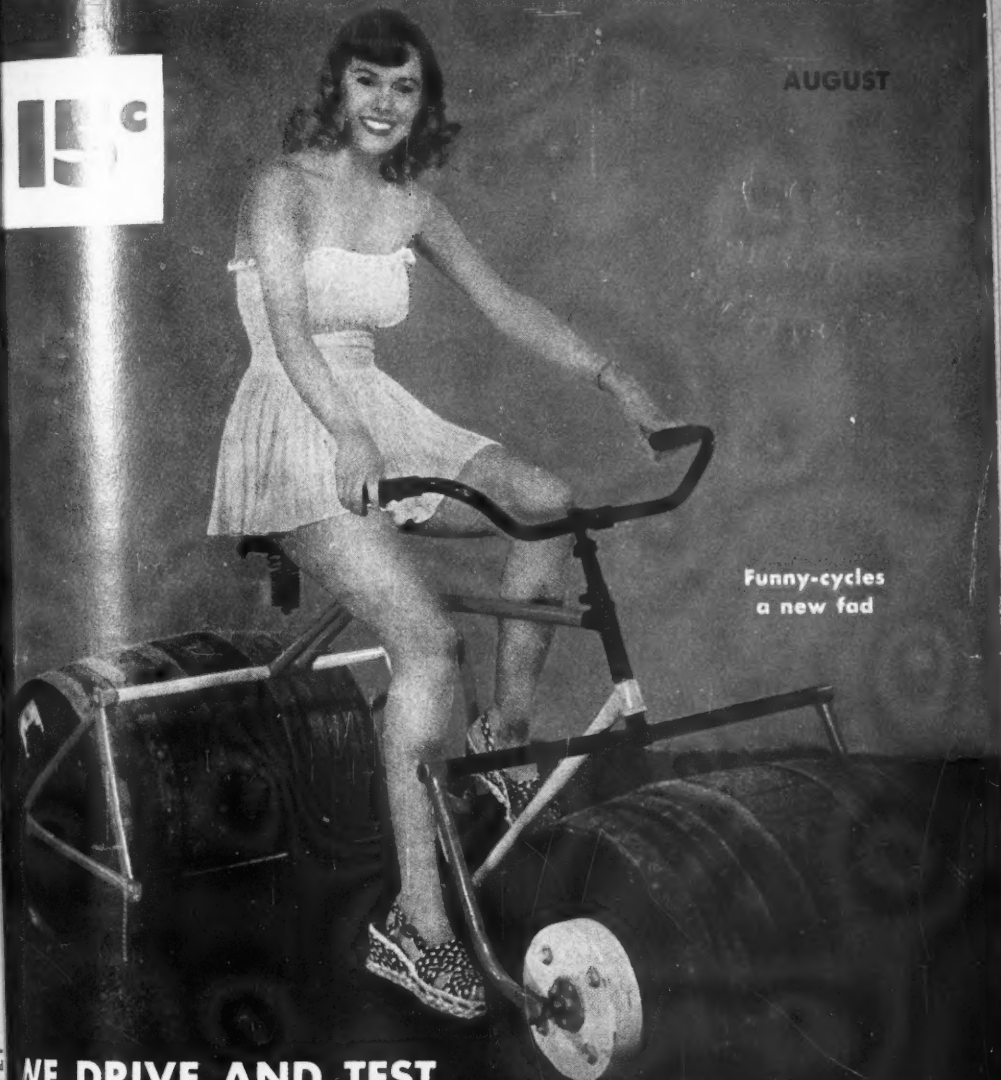

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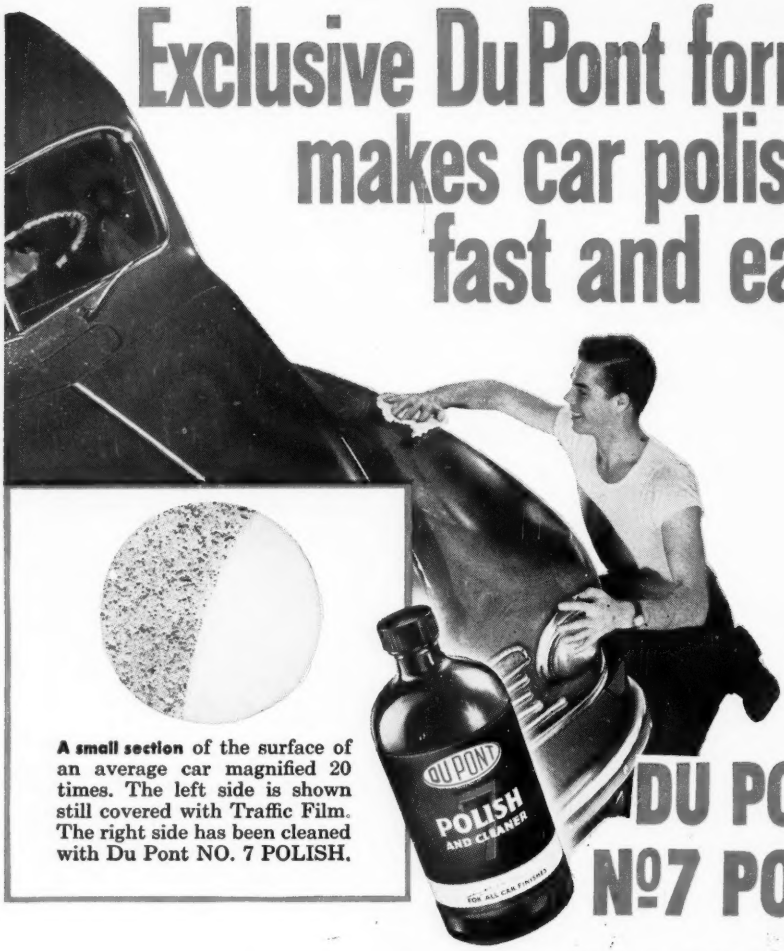

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special features

How It Feels To Drown 57
By Roger Burroughs

Funny-Cycles—New Fad 60

Beast Under Your Skin 62
By Donald G. Cooley

Rail "Canal" Across Mexico 66

I "Shoot" Wild Animals At Night 68
By Bob Ford

Birth And Death Of A Hot Dog 72

Can Moon-Power Increase Crops? 74
By K. R. Batten

New For The Home 78

This Month's Prize Gadget 79

We Drive And Test The New Tucker Car . 80
By Tom McCahill

MI Tests The 3-Wheel Davis 84

New For The Sportsman 86

Hobby Hall Of Fame—Fibber McGee ... 89

Money-Making Idea—A Pig Brought Home My Bacon 90

Our New Giant Flattop Will Launch Atom Bombers 92
By Jerry Greene

Cow Coats—More Milk 97

New For The Shop 100

New In Science 83, 88, 98, 99

Editor's Workbench 12

Invention Clinic 20

(Continued on page 6)

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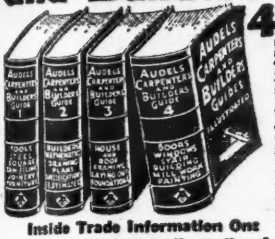

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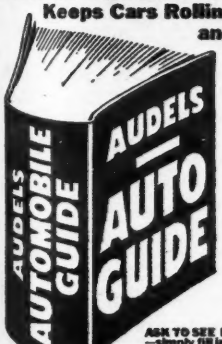

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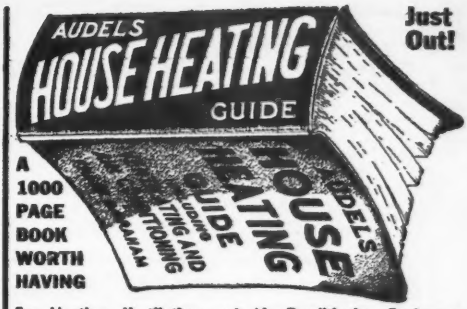

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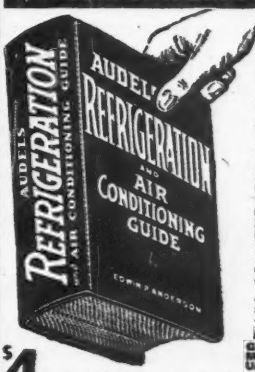

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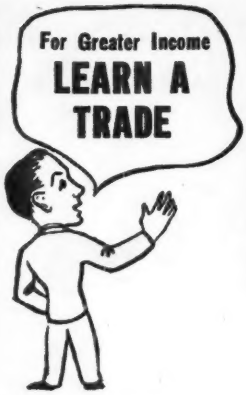

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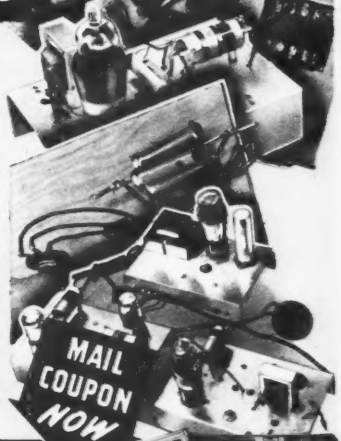

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[Continued from page 2]

Make Your Own Window Cornices 101

Sheet Metal Punch 102

Home Hints 104

MI's Portable Six-In. Telescope .. 106
By Robert Brightman

Seagoin' Signposts 110
By William F. Crosby

Control-Line Bellanca Flash 112
By Walter Musciano

Car Care 118

Behind The Wheel 119
With Fred Russell

Build Chessy 120
By Ernest Tucker

Pyramidal Bookcase 124

Modern Desk For Your Den 126
By Harrison Nevstadt

Auto Aids 130

Tot's Vanity Table 132

Monthly Photo Contest 134

To Diffuse . . . Or Not To Diffuse 136
By Jacob Deschin

Test Strip Technique 139

Photo Kinks 140

Question Box 141

Playtime Rocking Horse 142

Bench Block 144

Make This Silver Watch Band ... 148

"Poker Pete" Cigarette Bin 152

"Shoe-Shine" Mount 156

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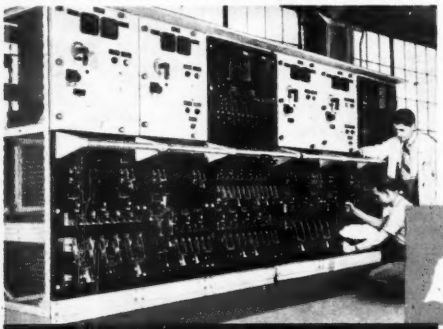

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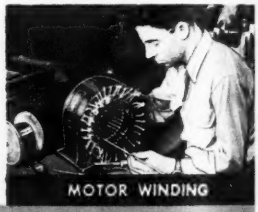

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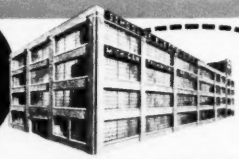

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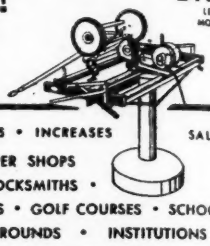

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The Editor's Workbench

MI's New Editor

With this issue William L. Parker, a Fawcett editor since 1937, takes over as Executive Editor of MECHANIX ILLUSTRATED, replacing Robert Hertzberg who, after 12 years with the company, has left us to enter the radio and electronics field. Bill is thirty-six, married, and lives on the Westchester County (N. Y.) shores of Long Island Sound in a 60-year-old reconverted barn whose Rube Goldbergish plumbing system and exotic structural design should offer him plenty of scope to practice what he and the other editors of MI preach every month in these pages.

Like Bob, his predecessor, Bill spent five years in the Army. He served in the Pacific and was discharged in 1945 as a major.

Welcome, Bill, and the best of luck to you in your new job.—*The Staff.*

What It's Like To Die

Ever wonder what it feels like to drown? Ever think how it would be if you were struggling against death in the water—alone and scared and helpless? If you have, don't miss Roger Burroughs' exciting, first-person story How It Feels To Drown, on page 57 of this issue.

We're featuring this remarkable personal experience article this month mainly because it's one of the most dramatic stories we've ever read. But also because we hope that the terror and fright this man went through may serve as a warning to any of our readers—and our editors, too!—who take unnecessary chances when swimming this summer.

Every year about 7000 of us Americans meet death by drowning—mostly because we fail to observe the rules of water safety laid down by the American Red Cross and other agencies who know all too well that the majority of these tragedies could have been prevented.

Read How It Feels To Drown. Then make up your own mind whether you're going to take any foolish risks in swimming this summer. Bet we know what you'll decide!

Plymouth International Model Contest

Detroit may be the automotive center of the world but from August 18 to August 23 it will rank as the number one model airplane city. The reason: the Second International Model Plane Contest, sponsored by the Plymouth Motor Corporation will take place.

The competition promises to be one of the best contests ever staged. For the past few months Plymouth dealers all over the country have worked hand in hand with the Academy of Model Aeronautics, staging elimination meets to determine the best model designers in the country. Five hundred of the nation's top model builders will gather in Detroit—with all expenses paid by Plymouth dealers—to compete for the 135 trophies and $7875 in cash prizes. If you're fortunate enough to be a resident or live within one hundred miles of Detroit, don't miss this outstanding competition. And if you live beyond the 100-mile mark, then read about the highlights in the November issue of MECHANIX ILLUSTRATED. Larry Eisinger, our Crafts and Hobbies Editor, will cover the contest and will select winning designs which later will be published in MECHANIX ILLUSTRATED.

Buick Convertible

Dear Editor:

For many years I have read MECHANIX ILLUSTRATED and found it interesting Your pictures of model planes and boats built by other readers have fascinated me.

[*Continued on page* 14]

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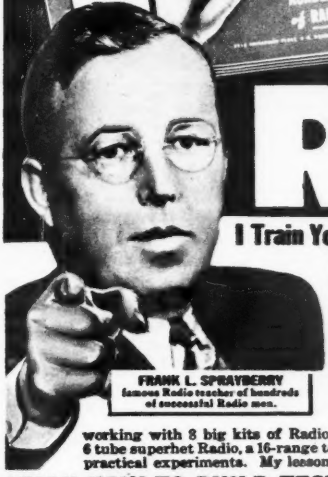

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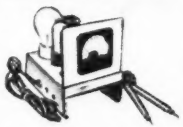

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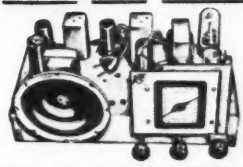

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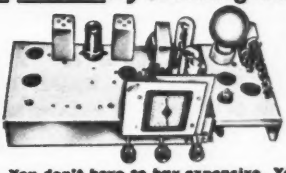

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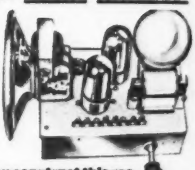

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[*Continued from page* 12]

Enclosed are photographs of a scale model car which I recently completed. The car is a Buick of the Roadmaster series and is made to the scale of ⅛ inch to the inch. The body and wheels are of wood and all the bright metal details of dural. The inside is finished in red leather and dural.

Pierre Langevin,
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Congratulations, Pierre, on one of the best looking automobile scale models we've ever seen. Now, if you'll just make a full-size model and send it in, we'll be glad to send you another check for five bucks. Aw, heck, we'll make it ten bucks.

Jimmy's Race Car

Dear Editor:

Here's a picture of a small car I built for my six-year-old boy. It was built from scrap material and a washing machine engine. It took about two years of my spare time to complete it.

The car is six feet long and is 26 inches from the ground to the highest point. Power is transmitted to the rear axle by means of an

[*Continued on page* 16]

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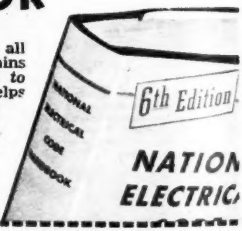

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City _____ Zone _____ State _____

—Check here if Veteran of World War II D

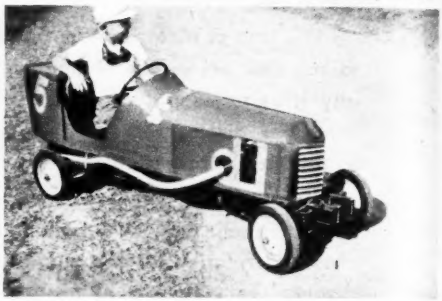
Editor's Workbench

[*Continued from page* 14]

automobile steering gear, worm-type, and a bicycle sprocket and chain geared to walking speed for safe operation. The gas tank is mounted in front of the radiator. A lever on the left side disengages the power. Rear springs are semi-elliptical, front springs are coil-type.

Needless to say, Jimmy is a proud boy.

C. F. Jensen,
4017 G Street,
Lincoln, Neb.



And unless we miss our guess, Jimmy's old man is a pretty proud papa, too. And why shouldn't he be?

California Cabin Cruiser

Dear Editor:

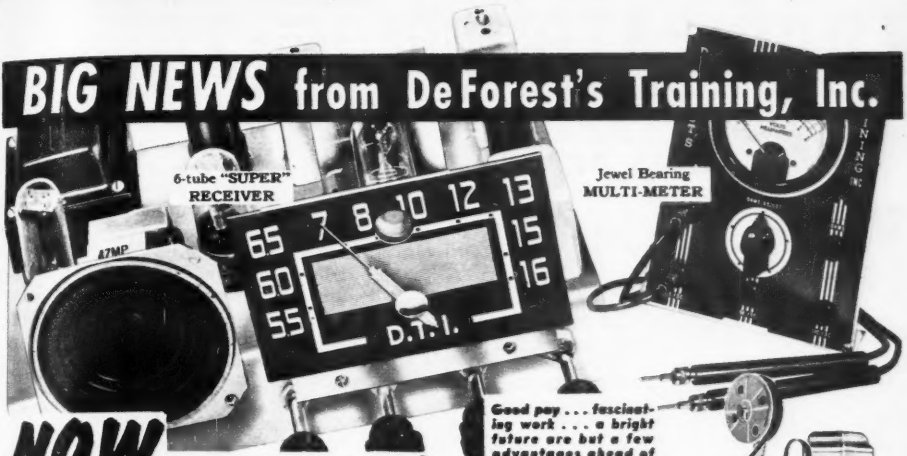
Enclosed is a photo of the boat I built from plans of "Cruise Mate" published in MI. The cabin was my design. There are bunks for three people and it is equipped with a stove and large ice box. It is powered with the recommended 22½ hp Evinrude and performs very well.

Ted Hill,
Box 518,
Yreka, Calif.

Perhaps the $5 check we sent you won't fill that large ice box with groceries, Ted, but do what you can with it and think of us while you're munching them.

[*Continued on page* 18]

BIG NEWS from DeForest's Training, Inc.



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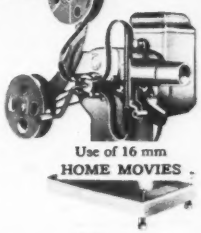

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Editor's Workbench

[*Continued from page* 16]

Fighter Plane

Dear Editor:

My control line P-38-L model required about 700 hours to complete. It was built from three small drawings. It is powered with two Super Cyclone engines, has a 5-foot, 4-inch wingspan, weighs 8¼ pounds and has been clocked at 73 mph. A flight timer is used to cut off both engines simultaneously. But the plane has flown well on one engine.

Last summer this ship won first place in the flying scale events at Nashville; Montgomery, Ala., and Louisville, Ky. It is a very stable flyer and is a pleasure to fly.

Richard M. Tichenor,
4101 Oriole Drive,
Nashville, Tenn.

A sweet-looking job. Lots of luck in future races, Dick.

Barnacle By Bob

Dear Editor:

I built "Barnacle" in about four months, working spare time only. This is the first boat I've tried my hand at, but I am planning to build another.

Bob Bodding,
Arcadia, Iowa

Go to it, Bob. Build as many boats as you want—just so long as you build them all from MI-tested plans, the best you can get. And send us some pictures of the next one.

[*Continued on page* 28]

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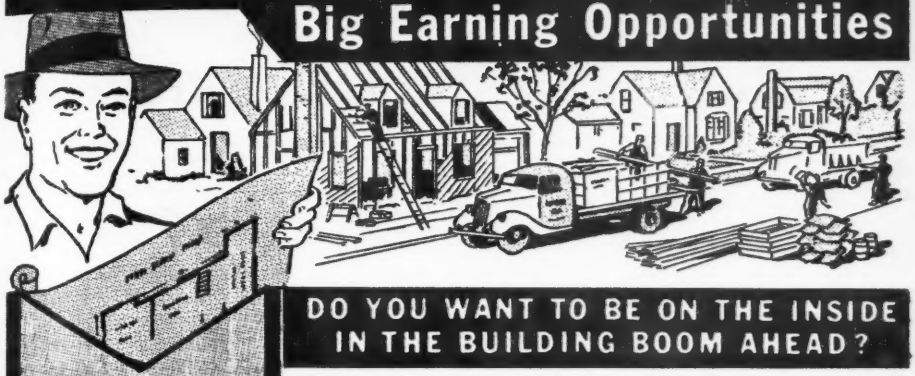

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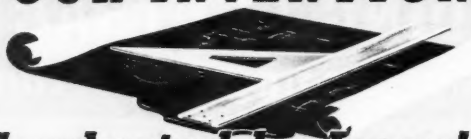
YOUR INVENTION CLINIC



Conducted by Joseph H. Kraus

To facilitate the answering of their mail, readers desiring the advice of Mr. Kraus on inventions matters are requested to observe the following simple rules: 1) Type or write clearly, on one side of the paper. 2) Make sure that your full name and address, including street number and postal zone, if any, are on the letter and all accompanying papers. 3) Mail drawings or photographs flat, not rolled, and include postage if you want them returned. 5) Do not ask questions relating to patent laws. 6) Do NOT send models.

Address your inquiries to "Your Invention Clinic," MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Mr. Kraus will answer as many letters as possible in this column. His services are free.

blade lock for pocket knife

David T. Burbank of St. Louis sends six photographs, a diagram and a description of a device to lock a knife blade in the open position. He wants to know what we think of his design.

ANSWER: We agree that in the interests of safety you should apply for a patent on your design. We like the idea. It's both original and good. Apparently it will be simple for a knife manufacturer to install your lock on nearly any style of pocketknife with very little retooling. In fact, the lock guides probably could be mounted directly under the retaining studs in the handle. The addition of a rule to the knife makes it a more useful tool and adds interest to the locking detail.

You might have trouble selling the patent outright but you may be able to sell the design by accepting a small down payment and a continuous royalty in place of a lump sum. From your point of view, the royalty plan should be more satisfactory, anyway.

Your design has good commercial value. We feel sure that some knife manufacturer will want to use this simple attachment because of the protection it offers against accidental closure of the blade. Patenting this item looks like a good bet all around.

safety cushion for plane crashes

Clarence A. Smith of Benton City, Washington, recommends an inflatable cushion for protection against injury in crashes.

ANSWER: Cushioning the area around the pilot and the passengers with an air-inflated cell would be a good idea if a way could be found for inflating the cushion in a split second and for signaling the pilot at the same time that a crash is inevitable. In not one case in a hundred does the pilot feel that he has lost control of his plane. Practically always he keeps thinking to the end that he is the master of the ship and knows just how to handle any trouble.

Nor is this a unique quirk. Every motorist has the same self-assurance without having had the intensive training a pilot gets. Here, too, accidents usually occur in a flash. If a motorist knew that he was about to become involved in an accident he could swerve, apply the brakes or even run into an embankment or tree. But everything happens too fast. There's no time to think about turning a valve to inflate cushions. Crash cushions have been built into planes before this but they were for stunt work. The average pilot does not anticipate any serious accident and he won't look kindly upon such a cushion. Also, airline passengers feel that air travel today is every bit as safe as riding on the ground, and they certainly would not care to be cushioned in either a bus or a train.

transplanting tool

Robert Berndt of Morristown, Minnesota, says he has designed a tool with which it is possible to set 2,000 plants in an hour.

ANSWER: No doubt your hand-planter does a good job for you but there are many other models which have appeared and which we feel sure do a better job than yours.

For example, you must turn your tool upside down to dig the hole for the plant. You then insert the plant into the proper grippers, bury the roots and invert the tool again to retamp the soil.

A planting tool developed by scientists in an agricultural college is loaded with a growing plant cartridge. This is a six-inch tube of organic material which disintegrates in the soil. The long point of the tool is set at the desired location. When you step on it, a trigger "shoots" the plant cartridge into the ground, and the tool is removed. With this tool the three steps required for your device are cut to only one. Nor is it any harder to plant the seeds in the cartridges than it is to plant them in regulation flats or beds. The cartridges will keep plants fresh for a long time, and there is

[*Continued on page* 22]

PATENT PROTECTION FOR INVENTORS

A patent is a valuable right. On the basis of a constitutional provision Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent.

Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered patent attorney, as the value of patents depends largely upon the skillful preparation of the specification and claims.

We recommend that you authorize us to conduct a search through the United States patents pertinent to your invention and to submit a report setting forth our opinion with respect to its patentability.

This firm is registered to practice before the U. S. Patent Office and is available to assist inventors in the preparation and prosecution of their cases. Detailed information and the preliminary steps to take to obtain patent protection will be furnished upon request. *Form below for mailing convenience.*

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• Your Invention Clinic

[*Continued from page* 20]

no transplanting set-back. With this tool you can plant almost as fast as you can walk, since a new cartridge is inserted while you're stepping to the second position.

You should improve your present design so that the operation of the tool will be a single, nonstooping, motion. When you have made a unit which will produce practical results under actual tests similar to the tests which you used to establish the value of your present tool, have the records searched to see if you may patent your device.

• gas-turbine investment

Harry K. Goodloe of Birmingham, Alabama, sends a batch of blueprints on a gasoline turbine. He says they represent all the data he has and that his interest in the project is to be entirely a financial one.

ANSWER: You mean to say that the only thing you know about the gasoline turbine is what is revealed in the blueprints? From our examination of these prints we'd say that some bright student did a lot of work. The prints indicate he must have felt that using the combination of steam and gasoline to provide power was a good idea. But then he includes a cooling system as well, for some reason we cannot fathom.

Now, there may be something to this combination but this should be disclosed to you by specifications and should be basically proved by laboratory tests or a mechanical and engineering report from an expert. You should not be expected to finance an invention based merely on blueprints.

In our opinion, the inventor is trying to use a dual-power cycle and is not doing so effectively. But we may be wrongly reading what's back of the blueprints. On the other hand, as the financier, you should know all the details of the scheme into which you are being asked to sink your money. We suggest that you find out the full story before you invest a single dollar.

• ideas vs. finances

Arch Hyden of New Castle, Indiana, lists a number of ideas in his letter and wonders what to do with them.

ANSWER: Before you can sell any idea, be sure that you have developed something which you have a right to sell. Perhaps the very things you think are original with you have been protected previously by others. The fact that you do not know they are on the market has no bearing on the matter.

Your description of the devices in which

[*Continued on page* 24]

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Your Invention Clinic

[*Continued from page 22*]

you are interested is too vague for a satisfactory understanding of the items. There are dozen of tire irons. In some places of this country the electric and gas service meters are so located that they can be read from the outside of the home. Tools are available for inserting all sorts of devices in steel windows.

The thing for you to do is to select your best design and have a search made. If the report shows that you may have a patentable item, you might try to get some of your friends to put up the money for protection, with the understanding that they will share in any profits from the sale of the invention. Maybe they will not be as enthusiastic about your designs as you appear to be. Perhaps the local manufacturer of metal windows will be sufficiently interested in your tool to invest in the patent and may even produce the tool.

Under present circumstances it would be good for you to trust someone. As matters stand now, you can do nothing with your inventions. And should one of them be stolen, you have suffered no great financial loss. So why not get some friend, who has the capital, to take a chance on your brain power? Both of you might benefit from such an arrangement.

corrugated fastener tool

William Kersten of Denville, New Jersey, sends a sketch of a tool for inserting corrugated metal fasteners.

ANSWER: This fastener-inserting tool looks worth while. It could be sold in the ten-cent stores and combined with any package of corrugated fasteners. One advantage of your design is that you could have the units made for you and could develop your own business if you failed to interest a manufacturer in it.

We recommend that you have a search made immediately to determine if patenting protection is possible. You should patent your item if the search reveals no similar tools or only inferior ones.

flapping-wing toy

Richard W. Coburn of Walpole, New Hampshire, sends a proof of invention and claims to have received a report, "The toy couldn't be made cheaply enough for the market." He wants our comment.

ANSWER: Your quoted statement is utter nonsense. With due respect to the organization from which this finding is said to come, we hold that the analysis was not well founded. With a little modification and a good production rate, your present design could be made

[*Continued on page 26*]

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Your Invention Clinic

[*Continued from page* 24]

to sell for less than a dollar. You should change the design so that manufacturing costs can be reduced greatly.

There is no justification for two sets of gears. The flapping wings can be operated from a bent crank connecting with the drive. A lever arrangement would give the same flapping effect. A single length of round wire then would replace: an entire gear train, all of the gear shafts in this train, the wing actuating disks, the disk shafts, the studs and a good part of the frame. You would thus cut assembly costs by at least 50 per cent. The entire frame is too wide. This can be cut to a tenth of the present width. The front wheel should not even be located within this frame. There is no need to waste the extra metal for that wheel. You have tried to make difficult a simple mechanical device.

But this isn't a good item. Flapping wings have been added to toys. We see nothing basically different in your design—nothing that could not be duplicated by any manufacturer in a dozen other ways, without interfering with any protection which you may be able to secure. So, unless you can manufacture the product yourself, don't waste any more time on this suggestion.

radio announcing system

Milton B. Teagarden of San Angelo, Texas, wants to know if he should continue working on an idea for a radio set that would take telephonic calls from the door of an apartment house or home.

ANSWER: What makes you think that everybody has his radio set turned on all during the waking hours? What happens with your electronic announcing system when the set is not turned on?

You should give much further thought to the entire program and how the connections can be made without the expense of hiring an electrician. Wiring in many homes is not too simple a matter. Variation in radio-set design is too great for coverage by any simple connection. Of course, you could use some of the new ultra-high frequency microphone styles of transmitters, but these probably won't carry

[*Continued on page* 28]

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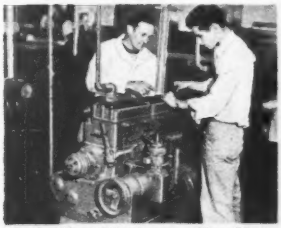

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Your Invention Clinic

[*Continued from page* 26]

a voice well enough from the lobby to an upper story of an apartment house.

Extension Socket

Arthur W. Tonn of Massillon, Ohio, sends patent drawings of an extension socket to which connection can be made even when the outlet is behind a heavy piece of furniture.

ANSWER: Unfortunately you give us little information on the operation of your electric connector adapter. You should have included the specifications. If the connector for the adapter is located behind a heavy piece of furniture, you must dangle the cord behind the obstruction and fish around for alignment of the cord plug and the adapter. Also it would seem that some rotation of the cord is needed in spite of the guides which you provide. To make the connection, the cord must be pulled just far enough. So, there should be a locking arrangement to prevent going past this point. Surely it is much more simple to install an extension outlet which will stay put.

We think that the sales price of this combination would be more nearly from 75 cents to a dollar than the much lower price which you have apparently established. We also wonder if this plug will get an approval certificate from the Fire Underwriters. But, if the price is right and if the plug is both approved and improved, you may be able to sell 10,000 of these plugs a year with good advertising. To be sure, there are a lot of "ifs" in this case but they existed even before you applied for a patent. Each must be eliminated before you can hope for success.

Editor's Workbench

[*Continued from page* 18]

New Alarm Clock Shakes Deaf Out of Bed

AN alarm clock which shakes the bed has been developed for the deaf and blind.

A powerful buzzer strapped to the bed springs or slipped under the pillow vibrates so violently that it shakes the bed and wakes the sleeper.

The new alarm clock is being produced by the American Foundation for the Blind and is especially useful to those who are both deaf and blind. It was made up from commercial clocks which are designed for such tasks as turning radios on and off at a set time. Buttons set around the dial, when pulled out, connect the current to a socket on the clock for 15 minutes for each button.

[*Continued on page* 30]

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Editor's Workbench

[*Continued from page* 28]

Death Rides in Seat Next to the Driver

"DEATH Seat" is the name given to the automobile seat next to the driver in a report to the American Medical Association.

Of 50 consecutive patients with face injuries from auto accidents, almost three-fourths were women who had been riding in the front seat.

Detroit police records show that in 219 accidents involving more than one occupant of a car, 260 passengers but no drivers were injured. More than half of the front-seat passengers had face cuts and damage to the teeth, chin, nose, cheeks, ears, forehead and skull.

Dr. Claire L. Straith, who prepared the report, suggested a way to keep death from riding next to the driver: Remove all knobs, cranks, drop-down ash trays and sharp ledges on the dashboard, and pad with soft rubber the dash in front of the passenger.

Sugar and Soap Help You Get a Better Tire

SUGAR and soap are helping make better automobile tires. They are used in a "redox" process in which synthetic rubber may be manufactured at a freezing temperature.

The quality of GR-S, the synthetic rubber blended with natural rubber in all tire treads, has been greatly improved by the recent development of the amazingly rapid process. Now rubber can be manufactured at freezing or sub-freezing temperatures instead of 212 degrees, the conventional temperature. The synthetic rubber seems to grow stronger and better as the temperature goes down.

In the "redox" process, petroleum compounds are first emulsified with a soap, and the reaction is started by a type of sugar.

Greatest Flying Hazard

WEATHER is the greatest hazard of air transportation, says Vice Admiral E. S. Land, president of the Air Transport Association of America.

Substantial progress in solving weather problems has been made, and more will be made in the next decade. But the future of the air transportation industry of America, the Admiral says, depends upon the degree with which it can provide reliable and safe service at a reasonable cost.

[*Continued on page* 32]

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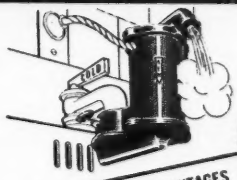

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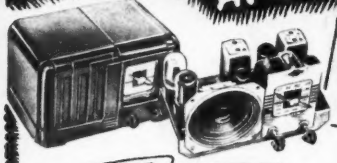

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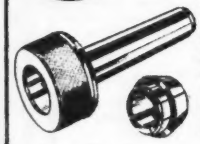

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Editor's Workbench

[*Continued from page* 30]

Torpedo From Canada

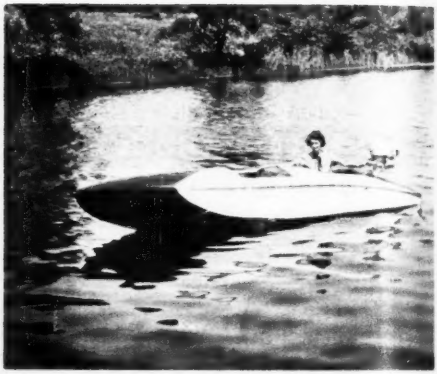
Dear Editor:

Here's a picture of the "Torpedo" which I built from your plans. I found the plans easy to follow although I am an amateur and this is my first one. I built it with very few tools.

The boat has been tried out with a Johnson 9.8 and also a Johnson Sixteen. It is all you could want in a boat of this type.

Howard H. Boyd,
Box 1299,
Smiths Falls, Ontario, Canada

And it's more than anybody could want from a fellow who never made an MI boat before. You guys who still haven't built your first one—let's get going! Look what a swell job Howard turned out. You can do the same with our easy-to-follow plans.



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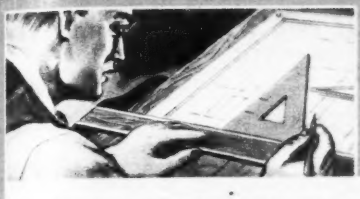
To each of the foregoing hobbyists MI has sent a $5 Editor's Workbench Award and a certificate, suitable for framing, which testifies to the winner's skill and workmanship.

Why not try to win one of these awards yourself? Send us a good, clear snapshot (be sure it's a glossy) of your construction project. In your letter give whatever details you think will interest other readers. And don't forget to include your full name and address. Send your letter and pictures to Editor's Workbench, MECHANIX ILLUSTRATED, *67 West 44th Street, New York 18, N. Y.*

[*Continued on page* 35]



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Editor's Workbench

[*Continued from page 32*]

My MI

Dear Editor:

I notice that you often refer to MECHANIX ILLUSTRATED as "MI," leaving out the periods following each letter. Seems to me the correct abbreviation would be "M.I." Then everybody would know it should be pronounced "Em Eye." Way it is, looks to me like the pronunciation would be "My."

Fred Langston,
Seattle, Wash.

Correct pronunciation of "MI" is "Em Eye," Fred. But a lot of MI's three-quarter million readers do pronounce it "My" magazine—and we're tickled to death that they do.

Duckling—MI's Next Boat Project

By the time next month's MI hits the stands, summer will be drawing to a close and you'll be regretfully making ready to store your boat away until spring. For the average boating enthusiast, the part of the year falling between Labor Day and Memorial Day is wasted and dull—it's a time when he has nothing to do but dream of the pleasures of the past season and conjure up pictures of what the coming summer will bring. But for the follower of MI's Boats-and-Boating section, winter is a time of undiminished activity and pleasure—he merely transfers his activities from the open water to the snugness of his workshop and enthusiastically tackles the thousand-and-one little jobs which, when accomplished, make his boat the envy of his local fleet.

Knowing this, we've come up with a really meaty project that we're featuring in the September MI. It tells how, with little labor, you can convert any 10- to 14-foot prosaic rowboat into a snappy sailboat that in the slightest breeze will scoot right along with no effort on your part. *Duckling,* as we call our conversion, is the result of the efforts of three experts. The principles of design involved were first discussed on these pages by MI's ace boating contributor, William F. Crosby, in the January 1947 issue. The actual details of this particular design were worked up by Naval Architect John G. Kingdon, our Boating Editor. And the step-by-step, easy-to-follow drawings come from the board of Artist Doug Rolfe, whose work for years has helped to make MI the leader in this field.

You won't want to miss the story of *Duckling.* Better stop by your favorite newsstand tonight and reserve a copy of the September MI!

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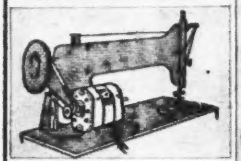

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Taste Test for Eggs: Biggest Are the Best

BIGGEST eggs taste best; littlest eggs are most likely to be bitter.

This general rule covering the flavor of birds' eggs of all species and sizes is derived from tasting experiments made under the direction of Dr. Hugh B. Cott of the University Museum of Zoology in Cambridge, England.

Eggs of 81 species of domestic poultry and wild birds, ranging from hen to wren, were sampled by a panel of three judges.

All eggs were served scrambled and steam-cooked and no specie was known in advance to the judges, except the high-grade hen's eggs used as a flavor standard. Each judge had a chance to sample all species of eggs at least twice during the test period.

By this critical but impartial method of judging, eggs of several species of gulls were rated just under hens' eggs and just over guinea-fowl eggs but several grades better than eggs of the domestic turkey.

The largest number of small birds' eggs fell into the "relatively unpalatable" group. Here were eggs of such birds as linnet, whitethroat, reed warbler and blackcap. At the very bottom were eggs of the common wren, with a rating only one-fifth as high as that of the best.

Eggs of intermediate taste, neither very good nor very bad, included such familiar species as magpie, pheasant, domestic duck, swallow, blackbird, cowbird and catbird

Birds' diets seem to have little relation to the taste of their eggs. Thus, eggs of fish-eaters like the gulls and terns ranked near the top and were not noticeably "fishy" to the taste. The scavenger carrion-crow was rated as producer of "intermediate" eggs, actually slightly better than those of pheasant or duck, wren's eggs were least tasty of all.

Some effort was made to test egg-eating animals' tastes by offering them choices between two kinds of eggs. The animals used—rats, ferrets and European hedgehogs—showed roughly the same preferences as the human tasters. Closest agreement came over the eggs nearest the bottom of the list.

Dr. Cott suggests that the bitterness of eggs may have some survival value to the birds under natural conditions, by causing potential nest-robbers to turn aside and seek food elsewhere.

Egg-eating animals also got a chance to show their taste in eggs. Surprisingly, the rats, ferrets and hedgehogs used in the egg testing had roughly the same preferences as did the human tasters. Like the men, the animals put the bitter eggs at the bottom of their menu and liked the biggest eggs best. Dr. Cott suggests that the bitterness of the smaller eggs may have helped the birds to survive by discouraging nest-robbers. •

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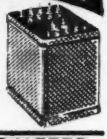

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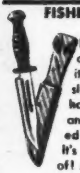

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Deep-Freeze Proves Nice for Keeping Mice

IF you have a zoologist in the family, don't be surprised if you find dead field-mice or ground squirrels in your deep freeze. Or maybe even bats.

Collectors of such small, furry specimens usually want to keep only the skins for study. But sometimes they trap more than they can conveniently skin at one session.

Donald H. DeMeules of North Minneapolis reports in the Journal of Mammalogy that he has found deep-freezing just the thing to prevent his field-mice from spoiling until he could get around to preparing their skins. Sealed in cellophane bags, the mice keep very nicely for two or three weeks.

Weapon Against Atom Bomb Found in Buckwheat

A potential medical weapon against the atom bomb has been discovered by Drs. Paul E. Rekers and John B. Field of the Atomic Energy Project at the University of Rochester at Rochester, N. Y.

Rutin, a bright yellow powder obtained from the green buckwheat plant (among many other sources) is the weapon. Atom-bomb victims who are not killed outright may be saved by this powder, which strengthens the walls of their blood vessels.

Bleeding that oozes blood into practically every organ and tissue of the body is a primary factor in the deaths of humans and other mammals exposed to atomic radiation, tests have shown.

Diesel Engines Take Steam Out of "Iron Horse"

DIESEL locomotives will be hauling most American railroad trains by 1958, President J. W. Barriger, of the Chicago, Indianapolis and Louisville Railway Companies, told the Society of Automotive Engineers recently at French Lick, Indiana.

Diesels already top steam locomotives in virtually all respects, he said, and rapid future progress in design and development will establish the diesel as definitely superior.

The gross annual expenses of owning and operating steam locomotives represent about 75 per cent of the original cost of these machines. The low cost of diesel maintenance is greatly in their favor, he declared.

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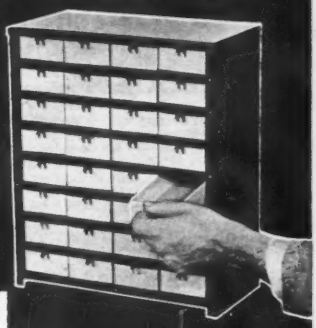

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"War Omen" Seen on Wings of 17-Year Cicadas

WAR prophets are having a field day around the headwaters of the Ohio. Big insects with a red "W" on each of their transparent, glistening wings are emerging by billions in wooded areas all over West Virginia, eastern Ohio and a small bit of Virginia. The flaming letters are being taken by the credulous as sign of a coming Armageddon.

Actually, they are nothing but one of the broods of the 17-year cicada, often misnamed the 17-year locust. The red "W" mark is a part of the normal structure of their wings. Since one of the 17 broods turns up somewhere in this country every year, there is never any lack of "war omens."

The 17-year cicada is a close cousin to the dog-day cicada or harvest-fly, whose insistent shrilling makes hot, drowsy summer afternoons seem drowsier still. The 17-year species has a similar voice. Since it is far more numerous, it will make day hideous during its brief life in the sunlight.

Although its life in the sun is short, this is actually the longest-lived of known insects. It lives above ground for five or six weeks, lays its eggs in furrows in the green bark of twigs, and dies. But the cicadas that hatch from the eggs drop to the ground, burrow in and lead subterranean lives, sucking sap from the roots of plants. Then they come up into the sunlight and repeat the short cycle of courtship, propagation and death.

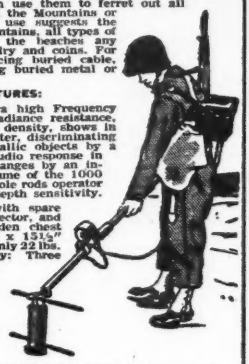
The 17-year cicada, mainly a northern insect, has a shorter lived but similar relative in the South, the 13-year cicada. The brood of the species is due in 1948 but has not been reported for a long time. It is supposed to exist along the boundary between Mississippi and Alabama, with some overlap in the Florida Panhandle.

These periodical cicadas create a good deal of alarm when their swarms appear, probably because of the traditional terror that attaches to their "locust" misnomer. They really do relatively little harm, though in some places they do damage nursery stock by causing twigs to fall off where their eggs have been inserted into the bark.

They are difficult to poison because they do not eat after they have emerged from the soil. Only contact poisons can have any effect. DDT has been tried but without success.

A less publicized insecticide, tetra-ethyl pyrophosphate, is reported by T. H. Parks, Ohio extension entomologist, to be effective against the cicadas. Since this compound is far more toxic to man than DDT, though, you should use it with great caution—or, better, leave it to professional experts. •

New ARMY MINE DETECTOR



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WIRE-UNUSED W-110-B two-strand ARMY FIELD WIRE—500 ft. $3.50, 1000 ft. $6.50. (One-mile reels also available.)

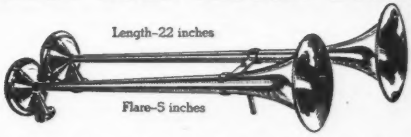
Write for New FREE Folder—Just Out!

All prices FOB Sacramento. No C.O.D. California residents add 2½% for sales tax.

SEND CHECK OR MONEY ORDER **LORIS SALES**

P. O. Box 1896-V Sacramento, California

CADET DUAL VACUUM HORNS



At the Low Price We Can All Afford

Here is your chance to get air horn results—looks, blast and beautiful organ tone—at a fraction of the cost of air horns. Spun brass with gleaming chrome finish or lasting lacquer. Positive operation. Complete unit consists of one pair of beautiful vacuum horns with the mounting brackets, valve, control handle, hose, fittings and installation instructions. Can be mounted on front fender or on top of or under the hood. A must for safety and smart appearance for any car. Chrome finish $29.50—Lacquer finish $23.75. Send check or money order and we will pay the postage—*or order C.O.D.*

The Protecturod Company Dept. 603
4033 Windsor Road - - Youngstown 7, Ohio

FREE Sample Of New PLASTIC Shows How To Make Leather and Leatherette LIKE NEW!

MAGICALLY CHANGES CLOTH TO IMITATION LEATHER

SAVE MONEY - TIME AND EFFORT by renewing Luggage—Leather Covered Furniture—Golf Bags—Auto Seat Covers—Restaurant Furniture, Booths or any Leather or Leatherette item with new plastic discovery called Leather-New. Cost cloth or cloth covered items such as Glider Cushions, Tarpaulins, Porch Furniture, Etc. and make them look and wear like they were leather. Spreads easily with brush or spray gun—leaves NO BRUSH MARKS. Simple Acids, Caustics and Alcohols do not stain this finish—It is sun and mildew proof. Stays Fresh and Clean as long as real leather. Comes in all standard colors. Just mail coupon for Free sample of Leather-New coated material which shows effects.

LEATHER-NEW PRODUCTS, 4723 Troost, Dept. M3, Kansas City, Mo.

OWN A PROFITABLE LIFETIME BUSINESS

Cash in on big profits to be made in this new business—Profits up to $700.00 monthly possible, renewing booths and furniture for bars, restaurants, grills, movie houses, etc. Mail name and address on 1c postcard—I'll show you how. **Jack Edwards, Sales Mgr.**

JUST MAIL COUPON
No Obligation

Leather-New Products,
4723 Troost, Dept. M3, Kansas City, Mo.

Name _____

Address _____

City _____ State _____

Fill Out—Mail Today

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- Educational Courses
- Homecraft Supplies
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Your advertisement can reach this mail-buying audience of nearly 2 million readers for only 40c per word . . . payable in advance . . . minimum 10 words. Copy to be inserted in Sept. issue must be in the office July 2nd. Mail to MECHANIX ILLUSTRATED, 67 W. 44th St., New York 18, N. Y. Word count: Zone number free. Figure one word: Name of state (New Jersey); name of city (New York); sets of characters as in key (14-D); also abbreviations as 35MM, 8x10, A.D. A.C.

ADVERTISING SERVICE & AGENCIES

ADVERTISE: 24 WORDS, 40 Newspapers $3.50. Lists Free. Advertising Bureau, 229-B Dixon, Uniontown, Penna.

24 WORDS IN 64 weeklies $4.96. J. Darnell, 730 Hays, Jackson, Tenn.

AGENTS WANTED

MAKE UP $200 per day taking orders for nationally advertised pliers and wrenches—thousands now in use by garage, radio, factory and home mechanics. Complete 8 pc. wrench set in transparent roll sent postpaid for $2.00 cash or check with order. Stephens Tool Works, P. O. Box 306, La Tijera Sta., Los Angeles 43, Calif.

MAKE MONEY easily. Fast-selling line 50 new boxes Christmas, Everyday Cards, Stationery. Unusual Christmas Carol, Americana, Etching, "Flocked" Initial Stationery, others. Profits to 100%. Bonus. Special money-saving offers. Experience unnecessary. Write today for Christmas Leader assortment on approval and free samples 5 different Name Imprinted Christmas Card lines, Personal, Floral Stationery. Elmira Greeting Card Co., M-33, Elmira, N. Y.

NEW EXTRA money plan. Make up to 100% profit—without experience—showing Christmas, Everyday Card assortments, Wrappings, Stationery, Coasters. Unusual, attractive. Bonus. Special offers. Send for free samples 30 different Name Imprinted Christmas Cards, 50 for $1.00, 25 for $1.00 and $2.00, Stationery, Coasters, Christmas, Everyday assortments on approval. Thomas Terry Studios, 90 Union Ave., Westfield, Mass.

EASY! FASCINATING! Profits to 100%. Bonus. 31 new greeting card boxes 30c up. 5c and 10c individual cards, stationery. Request free Name Imprinted and Floral Stationery samples, free 32-page catalog and $1.00 All Occasion Assortment on approval. Special offers. New England Art Publishers, Dept. 198, North Abington 87, Mass.

AT LAST! Something new and sensational in Christmas Cards. Gorgeous satin, velour designs never before offered. Amazing value! Gets orders fast. Name-imprinted Christmas Cards, 50 for $1 up. Big Profits. 30 other assortments 60c to $1. Imprinted Stationery. Samples on Approval. Puro Co., 2801 Locust, Dept. 864-K, St. Louis, Mo.

FAST SELLING line beautiful Christmas and All-Occasion Assortments, Gift Wrappings, Personalized Stationery, Matches, Playing Cards, Coasters, Napkins, Guest Towels. Profits to 100%. Free Samples. 50 for $1.00 Personal Christmas Cards. Special offer. Write Senrab Co., 212 West Washington St., Syracuse, N. Y.

BIG MONEY. Sell friends, others, exclusive Christmas card assortments unobtainable elsewhere. Profits to 100%. Bonus. Request free samples exclusive 50 and 25 for $1.00 Name Imprinted Christmas Cards with Christmas and Everyday assortments on approval. Regal Greetings, Dept. ML-2, Hazel Park, Mich.

CHRISTMAS CARD agents! Exclusive, new plastic, sachet, panorama and carols assortments. Five leading 21 card $1.00 feature assortments. Six portfolios of personal cards. All this plus America's fastest imprint service. Free samples. Elmcraft Card Co., 5930 So. Western, Chicago 36, Ill.

$25 YOURS FOR selling only Fifty $1.00 boxes, new exclusive different Christmas and All-Occasion cards; also extra cash bonuses. Send for Champion Cheerio 21-card box on approval. Free samples 6 new personal groups and stationery. Write Today. Dept. 47, Pen-Brush, 154 Nassau St., New York 7.

AMAZING OFFER—$40 is yours for selling only 50 boxes, each containing 25 new, entirely different Deluxe Christmas cards with or without name imprinted. Also 50 for $1.00. Free samples. Other boxes on approval. Write today. It costs nothing to try. Cheerful Card Co., 388 White Plains, N. Y.

CHRISTMAS CARDS. Earn $3 an hour. Take orders galore from friends. America's Fastest Selling 21 Christmas Folder Assortment. Smart. Distinctive! Costs 50c. Sells $1. A complete line. Samples on approval. No investment. Sunshine Art, Dept. MS-8, 115 Fulton St., New York 8, N. Y.

SALESMEN: $20 TO $30 a day easy. Sensational new Raised Letter Metal Nameplate, beautifully framed in Mahogany. Amazing seller to homes, stores, offices, etc. No deliveries. Get our tested plan. Write Raised Letter Metal Co., Dept. 2298, Fox Bldg., Philadelphia 3, Penna.

CALL ON friends with sensational Christmas Cards in handy assortments. Sell for $1.00. Profit up to 50c. Also popular-priced Personal Christmas Cards, Everyday assortments, Stationery, Imported Napkins. Samples on approval. Wallace Brown, Dept. H-4, New York 10, N. Y.

MAKE MORE money selling personal initialed individualized belts, buckles, cap badges, tie holders, name plates. 2,000 emblems to choose. Big profits, whole or part time. Write today—special outfit offer. Hookfast Specialties, Box 1425, Dept. 4, Providence, R. I.

EXCELLENT SIDELINE for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco," XL-Roxbury, Boston 19, Mass.

BARGAINS—SAVE up to 50%. Hosiery, Lingerie, Toys, Blades, Spices, Specialties, Carded Goods, Dry Goods, Toiletries, Stationery, Jewelry, Notions, Soaps, etc. Postcard brings Free catalog. Reliable Jobbers, 930 W. Roosevelt, Dept. C-8, Chicago 8.

LECTRIK SILVER Kleaner Atomic Metal Electrode Plate (magnetic principle). Detarnishes silverplated ware (and other metals) quickly. Simply dip, rinse, dry. Agents wanted. Part or full time. NuProcess Products, Aurora, Ill.

CHRISTMAS CARDS. Earn $5.00 with every ten $1.00 21 card boxes you sell. Also new Plastic Cards, Personalized Cards and Stationery. Note Paper and Wrappings. Send for samples today. Howard P. Ellis, Dept. MI-7, Pitman, N. J.

LOOK HERE! Wanted—Men to start in business on our capital. Sell some 200 farm-home Products. Thousands our Dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. H-192-MOM, Freeport, Ill.

POCKET PAL: Replaces pocket knives. New, Safe, Beautiful. Always razor sharp. 50c seller. 231% profit. $15.00—or more daily. Agents, Salesmen, Distributors. Sample 10c. Nelson Mfg. Co., 222 W. Kellogg, St. Paul 2, Minn.

FREE SAMPLE! Big profit opportunity with amazing Glow-in-the-Dark House Numbers, Switch Plates, Pictures, Decals, Religious Articles. Represent large manufacturer. Madison Mills, 302 Fourth Avenue, New York, N. Y.

MAKE SENSATIONAL Profits! New, sell-on-sight Plastic Line: Tablecloths, Aprons; many other splendid fast-selling items, novelties. Postal brings free details, special deals. Hurry! Royalty, Box J-748, Passaic, N. J.

MAKE MORE money in spare time handling magazine orders. Fall best selling season. Our helps build big repeat business. Wholesale catalog Free. Write McGregor Magazine Agency, Dept. 11, Mount Morris, Ill.

AGENTS WANTED for our coin operated amusement machines in every town and community. Sell to clubs and homes; or start a route. Webb Distributing Co., Dept. M-12, 6 S. Kedzie Ave., Chicago 12, Ill.

WOULD YOU pay 3%—first $350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home, office. Expect something odd! Pacific, Oceanside, Calif.

"FORTIFY THE FUTURE." Start own business; home, office. Booklet describing "Collection of 137 Tested Plans" free. Elite Co., 220-G Grand St., New York 13, N. Y.

SELL BOOKS by Mail. Mammoth Sales and Huge Profits. Everything furnished. 3c stamp brings complete details. Box 177, Madison Sq. Sta., New York 10.

GET INTO Selling! Learn the real Know How that will bring you More sales—Greater earnings. Facts Free. A. P. Schibani, Box 1576M, Birmingham 1, Ala.

A DRESS Yours with every 3 you order for yourself and family. Amazing new bonus plan. Everything Free. Harford Frocks, Dept. 19130, Cincinnati, Ohio.

SHINE SHOES without "Polish." New invention. Lightning seller. Shoes gleam like mirror. Samples sent on trial. Kristee 125, Akron, Ohio.

MEN CALLING on stores. New carded foot item. Big earnings—steady repeats. Write: J. E. Pera M.O. Co., Box 5047-M, San Francisco 11, Calif.

INFORMATION—WHOLESALE supply sources. Moneymaking plans. Increase your income! Write Reynard Research, Smithfield 3, Ohio.

RAISED WOOD sign letters all sizes. Factory prices. Send 10c for catalog. Sign Letter Distributors, P.O. Box 101, Mineola, N. Y.

SELL NEW, used clothing from home, auto, store. Wholesale catalog Free. Calumet Sales, 4719 Kennedy Ave., East Chicago, Ind.

GET 400 MONEY Making Ideas. Formulas. Plans. Schemes. Folio Free. Formico-Spec., Box 572, Dayton, Ohio.

SELL CHRISTMAS cards—50 for $1.00. Complete line. Wade, 130 Eureka, Greenville, Miss.

SELL GOLD embossed monogram stationery. Sample free. Dunbars, Sanford, Fla.

AUTHORS' SERVICE

NEW WRITERS needed to re-write ideas in newspapers, magazines and books. Splendid opportunity to "break into" fascinating writing field. May bring you up to $5.00 per hour spare time. Experience unnecessary. Write today for Free Details. No obligation. Postcard will do. Comfort Writer's Service, Dept. 33, 200 S. 7th St., St. Louis 2, Mo.

I WANT new writers to cash hundreds of checks for $1 to $100, offered each month. The easiest way to write for pay. No previous experience necessary. Send for free details. No obligation. Saunders M. Cummings, 467-B Independence Bldg., Colorado Springs, Colo.

AVIATION

AIRCRAFT AND Engine Mechanics' Manual (Zweng) $3.00; Flight Engineer Manual $4.00; Link Instructor Manual $4.00; Stop Watch $9.95 (Surplus); Fairchild Sextant $12.50. (Free Folder.) Pan-American Navigation Service, 12021-M Ventura Boulevard, N. Hollywood, Calif.

"ROSS" GUARANTEED questionnaires for all C.A.A. ratings. Ross Aeronautical Services, Dept. 1-A, Box 1794, Tulsa, Okla.

BUILD, FLY bullet raceplane. Fast, light monoplane. Blueprints $2.00. Corberaft, 90 Maxwell, Rochester 11, N. Y.

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WRITE FOR complete list of used marine motors. Many bargains. All units factory rebuilt and guaranteed. Also many lighting plant bargains. Universal Motor Company, 462 Universal Drive, Oshkosh, Wis.

AMAZING BARGAIN Catalog. Save up to 75%. Watches, clothing, sporting goods, novelties, etc. 25c (refunded first order). Tip-Top, Box 9083, Dallas, Tex.

U. S. SURPLUS plywood radio parts chests. For tools, fishing kits, etc. $1.98 postpaid. Eastern Supply, 721 W. 4th St., Wilmington, Del.

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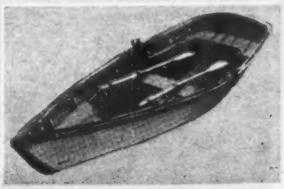
SEE OUR ad under Motorscooters for Midget Car bargains. Midget Motors Directory, Athens, Ohio.

"84 CARD TRICKS," 25c! Free Book Catalog! Hirsch, Spring Valley 1, N. Y.

LEATHER SCRAP—Bargain Assortment—50c pound. Donroy, Box 41, Bethel, Conn.

LAKE SKIFF PLANS



A light and sturdy 12 ft. skiff whose simple design and construction make her an ideal "first boat" for the amateur builder. Because of the plywood planking, the skiff is permanently leak-proof and can be stored out of the water without opening any seams. Plans show step-by-step assembly; include material list. Plan No. 923, price $1.50. Send order and remittance to: Mechanix Illustrated Plans Service, Fawcett Building, Greenwich, Connecticut.

SALESMEN WANTED

BRAND NEW!! Revolutionary Products!! Salesmen make $10,000 yearly selling one complete lighting line. "Neo-Glo" fluorescent changeable message sign replacing neon, "All-Lite" table lamp using upright fluorescent tube, spectacular "Circline" fixtures using circular tube. Verticals, Dual-Rays, Pin-Up Lamps, a complete line of fluorescent and incandescent fixtures covering every commercial, industrial, residential need. A triple sales plan insures your success whether you choose selling dealers, direct, straight commission or distributorship on our capital. Get set now with our growing progressive organization. To get you started, we will send a beautifully illustrated catalog showing over 200 profitable, sales-tested styles and models. Order blanks, sales helps, everything needed to start at once included. It costs you nothing. Rush name quickly—today—and start making real money. Rose Company, 539FF South Franklin, Chicago, Ill.

I'LL PUT a "shoe store business" in your pocket! You get everything Free! We train you to pile up Big Profits through exclusive factory fitting service. Year 'Round Repeat Business. You draw on 100,000 pairs for men, women. Leading line of its kind, Nationally Advertised. Write Today for Free Sample Outfit! Consolidated Shoe System, Dept. S-140, Chippewa Falls, Wis.

START YOUR own business on our capital. Always your own boss. Hundreds average $6,000 to $25,000 annual Sales year after year. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. H-UI-MOM, Freeport, Ill.

ADVERTISING BOOK Matches—Cash in on political campaigns—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash Commissions. Superior Match Co., Dept. F78, 7330 Greenwood, Chicago.

EARN $50 TO $75 WEEK EXTRA. Offer men's beautiful ties at wholesale factory savings. Exclusive new patterns. Make up to $75 week extra. Show neighbors, associates. Write today. Dept. 6, Hopkins Tie Co., 100 Hopkins Place, Baltimore, Md.

REVOLUTIONARY PRODUCT! Thousands prospects everywhere. Men earning up to $250 week. Placed on free trial—sells itself. Orders financed by factory. Special Demonstrator Offer. John Wilson, 2433 Indiana Ave., Dept. 355, Chicago 16, Ill.

BIG MONEY Quickly and Easily taking orders for complete line Personalized Initialed Buckles, Belts, Cap Badges, 2,000 Emblems. Fast repeats. Write today. Hook-Fast Company, Box 480-MI, Roanoke, Va.

BIG MONEY Taking Orders: Shirts, ties, sox, pants, jackets, sweaters, shoes, uniforms, etc. Sales equipment Free. Experience unnecessary. Nimrod, 4922-AR Lincoln, Chicago.

TREMENIDOUS PROFITS wholesaling drug-variety lines' valuable samples, $1.00 (refunded). Confidential information, 10c. STONE, Lunenburg 40, Mass.

LOOK! ELECTRIC razors $2.25 with overnight case. Free delivery. United Company, 404 W. Franklin Street, Baltimore 1, Md.

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NEW METHOD of casting Metal Toys and Novelties opens opportunity for full or spare time business and profits. Latest 1948 scale model Autos, original Ashtrays, Savings Banks, Water Pistols, etc., easily cast with bronze moulds. Big wholesale and chain store Xmas orders now being placed keep manufacturers busy. No experience or special place necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co., Dept. 2, 1696 Boston Road, New York 60, N. Y.

COIN MACHINES earn big money! Machines at $10.50 earn as high as $5.00 weekly profit. Place machines in stores, hotels, filling stations, etc., and your income starts immediately. Routes can be operated in spare or full time with no experience needed. We'll tell you how and send you a catalogue describing our nut, candy, gum and postage vendors; also scales, amusement games, etc. Write immediately to Parkway Machine Corporation, Dept. 15, 625 W. North Avenue, Baltimore 17, Md.

START YOUR own business on our capital. Always your own boss. Hundreds average $6,000 to $25,000 annual Sales year after year. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. H-U-MOM, Freeport, Ill.

BRONZED BABY shoe mountings and supplies. All metal bronze bookends, picture frames, ashtrays, etc. Onyx ashtrays, desk sets, plaques. Hardening solution, 30-amp plating rectifiers with powerstat control, $85.00. Geared motors for agitation, $20.00. Lead lined tanks. Write for list. Hollywood Bronze Supply, Dept. 112, 1778 N. Vermont, Hollywood 27, Calif.

SPECIALTY MANUFACTURING, the big money business that can be operated anywhere, start on a very small capital; we supply dependable formulas and complete instructions; get interesting Free booklet, "Money-making Opportunities in Specialty Manufacturing." Howard Robinson, Ph.G., 1300-D South Ohio Street, Sedalia, Mo.

RUBBER! WHITE liquid rubber! America's finest flexible molding rubber! New! Extra heavy viscosity! Quick drying! Ideal for home, classroom, or industry. Only $7.95 per gallon, $2.95 per quart, and $1.00 per half-pint sample. Parcel post prepaid! Plastercraft Supply Company, 3051 St. Clair Avenue, Cleveland 14, Ohio.

YOU MAKE them. We sell them! New liquid plastic makes many items. Terrific demand! Earn minimum of $50.00 per week at home. No experience or machinery required. We supply raw materials and instruction. Write Travaco Laboratories, P.O. Box 1883, Boston 5, Mass.

BRUSH PLATING Outfits connect to a battery. No tanks necessary. Almost as simple as painting. Your opportunity to make good income plating, autoparts, bathroom fixtures, reflectors, mirrors. Get free proof and particulars that put you in a paying business of your own. Gunmetal Co., Ave. A, Decatur, Ill.

USE SIMPLE home-made equipment. Make Hollywood style cement pottery, birdbaths Beautiful chemically colored garden things. Amazing designs. Dime brings pictures, color sample, details. Hollywood Cementcraft, 8527-F Wonderland, Hollywood 46, Calif.

READ "ADVANCE"—Voice of Mail Order. Offers Personal Guidance, Sources of Supply, Benefits, etc. Published Monthly. Sample Copy, 25c. Yearly Subscription, $2.00. Advance Publishing Co., 303 Fourth Avenue, Suite 410, New York 10, N. Y.

MAKE MONEY making new greaseless doughnuts at home with electric machine. Wholesale to grocers, drug stores, cafes, hamburger shops. Send for free recipes and plans. Irving Ray Company, 3605 South 15 Ave., Minneapolis 7, Minn.

LIQUID MARBLE—make in any color. Soundproof Plastic Flooring. Flexible Molds. Cast novelties, plaques, statuary. Big Money—your own business. Catalog Free. Write—Bing Products, 68A Broad Street, Boston 10, Mass.

COLORGLAZED CONCRETE pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leaksealing. Money-making projects. Booklet, details free. Men only. National Pottery, Grand Rapids, Minnesota.

3% OF PROFITS brought me independence. I'll tell you how. Profitable sparetime home business for men and women. Perfume—make it yourself. Directions Free. Write today. "International," 6347 Parnell, M.I.30, Chicago 21, Ill.

TRADE MAGAZINES help you get ahead. Latest copies every trade, business or interest for only few cents each. Write today for Free price list. Commercial Engraving Publishing Co., 34W North Ritter, Indianapolis 19, Ind.

WANNA START in business? Then "look before you leap"! Man, over 45 years' business experience can advise you on business, marketing, vocational problems. Replies confidential. David Ornsteen, Box 985, Los Angeles 53.

WOULD YOU pay 3%—first $350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific, Oceanside, Calif.

A FACTORY in your home garage! Mfg. and sales rights, mechanics' waterless hand cleaner. $500-$800 monthly. No special equipment necessary. Western Aircraft Mfg., Dept. H, Los Angeles 6, Calif.

START HOME business making statuettes, plaques, artificial marble flooring, liquid marble, flexible molds, metallizing baby shoes. Amazing profits. Folder free. Creative, 236-A, Winnetka, Ill.

AMAZING HOLDING screw drivers! Insert, remove screws inaccessible places! Exclusive distributor; factories, garages, mechanics, stores buy quantities. Millenco, 273 Miller Bldg., Boston, Mass.

WATCHES, WHOLESALE: Rebuilt Elgins, Walthams, Bulovas, etc., new and used Railroad, Stop, Diamond, Rhinestone, $9.50 up. Catalogue free. Brookings, B-DH1975, Little Rock, Ark.

MAKE $5.00 PER hour full or spare time right at home Preserving Baby Shoes in real Bronze, Gold, Silver and Pearl. Full details Free. Kikitavi Co., C-2111 W. Manchester, Los Angeles 44, Calif.

BUYERS WANTED for plaster novelties and Religious statuary. Painted—unpainted. Retail—wholesale. Write today for free information. Bing Products, 88-X15E Broad, Boston 10, Mass.

LEARN PIANO Tuning, Repairing, at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School of Piano Tuning, 606 East University Ave., Champaign, Ill.

BEGINNERS—STOP experimenting! Amazing new book "Principles Mail-order Selling" tells how. 25c postpaid. Satisfaction guaranteed. Publishers, Box 1302-B8, Detroit 31.

DEMONSTRATE PROSPERITY—Sensation 5 Way Profit Plan for Local Or Mail Order Selling. Big earnings. Facts Free. Paul Weidner, 379 M. Geneva Ave., Dorchester 22, Mass.

EXTRA DOLLARS or a good living with your typewriter. New, exclusive opportunity. Never before offered. Get details now. Schroder, 221 Bush, Covington 4, Ky.

"HARNESSING THE Earthworm." Author will mail valuable free booklet: "Successful Earthworm Breeding." Thomas J. Barrett, Dept. 4-C, Box 488, Roscoe, Calif.

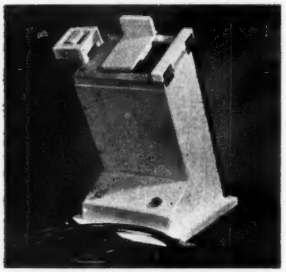
LOCKSMITHING SECRETS—key fitting, lock opening, repairing, prices to charge, supply sources, illustrated book only $1.00. Wechsler, 7 W. 36, New York City.

START PROFITABLE Mail Order Business. Run Ads, Forward Orders, Keep Big Cash Commissions. Details Free. McKitrick Publications, Mt. Vernon 10, Ill.

MAIL ORDER Offers Increased Income, Independence, Unlimited Possibilities; Free Literature. Manhattan House, 126-N Lexington, New York 16.

OPERATE PROFITABLE home business selling merchandise by mail. Fast sellers. Large profits. Powell Service, 5713 Euclid, Cleveland 3, Ohio.

JIFFY SLIDE PRINTER



This miniature positive printer will enable you to print your 35mm or Bantam negatives as positives for nearly lifesize projection. It is made of plywood and the construction is unusually easy to follow; can be built at a cost of less than $2.50. Blueprints and text are available from MI Reader Plan Service, Fawcett Bldg., Greenwich, Conn., for $1.00. Ask for Plan No. P-5.

FORTUNES HAVE been made in Mail Order. Let a man who has done it show you how. Circular free. Success Society, Box 5096, Houston 12, Texas.

OPERATE PROFITABLE Mail Order Business. Splendid Opportunity. For Details Write V. M. McKinley, 76 Ave. "A," Battle Creek 30, Mich.

EARN UP to $520 month part or full time keeping books for small firms. Simplified System. Write Tax-Saver System, Dept. U, Ft. Worth, Tex.

LIQUID RUBBER for making flexible molds. Cast novelties. Sample bottle 25c. Free literature. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

MAILING POSTCARDS selling repeat merchandise is profitable. Everything supplied. Details free. Gordin Publishers, Box 23, Pawtucket, R. I.

BE YOUR Own Boss. Metallize baby shoes at home spare time; your own business. H. Schwieger, 8404 W. Chestnut, Wauwatosa 13, Wis.

SELL GREETING Cards, Pictures, Signs, Novelties, Books! Large Profits! Catalog Free! Elfco, 434 North Wells Street, Chicago 10.

SELL BY Mail! Ideas Galore! Join Mail Selling Opportunities Club! Details Free. Chas. Wehner, Box 142-B, Roxbury 19, Mass.

START OWN Business—home, office; booklet describing "137 Business Plans" free. Elite Co., 220-G Grand Street, New York 13, N. Y.

OWN MIRROR Shop. Resilver Mirrors. Glass Sign Making. Electroplating. Supply Prices. John Sprinkle V33, Marion, Ind.

SELECTED OPPORTUNITIES local-mail order, new edition. Particulars free. Fiasco Sales, 2505B-150 St., Flushing, N. Y.

LEARN HOW to operate profitable Mail Order Business. Free literature. Foster, 10 Gibson Terrace, Connellsville, Penna.

HOW AND where to obtain capital, small and large loans. Details sent free. Write today. Star Service, Wapakoneta, Ohio.

BABY SHOES preserved. Formulas, instructions, $1.00. Supplies and bases. Novelty Bronzing. Box 56, Hyde Park 36, Mass.

METALIZE BABY SHOES and other nonmetallic articles. Fascinating work. Big profits. Shuplate, Box 1388, Lawton, Okla.

NO SELLING, operate vendors, amazing profits. details free. Factory Silver-King Corp., 622 Diversey, Chicago, Ill.

BABY SHOE metallizing. New system assures success. Details free. Treasures Forever, 89-A Henry Ave., Lynn, Mass.

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MAKE PLASTIC Wallets. Men's and Ladies' Styles. Details free. Lakeshore Supply, 534 Surf St., Chicago 14, Ill.

400 MONEY PLANS. Ideas. Formulas. Tips. Success schemes. Folio Free. Formico Mc., Box 572, Dayton, Ohio.

MANUFACTURE CLEANERS — Flavors — Cosmetics—Polishes. Formula Catalog Free. Kemico, Parkridge 60, Ill.

START BUSINESS! "With $1.00"! Moneymaker! Free Sample! Stephens, Grand Junction 1, Colo.

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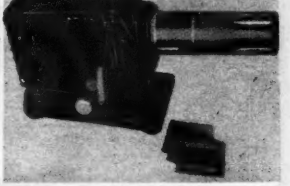

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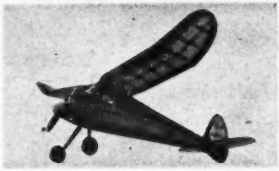

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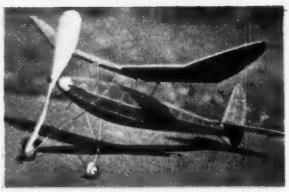

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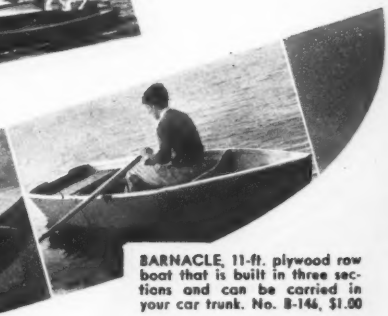

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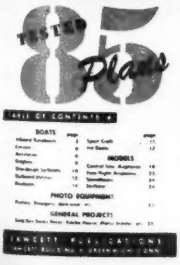

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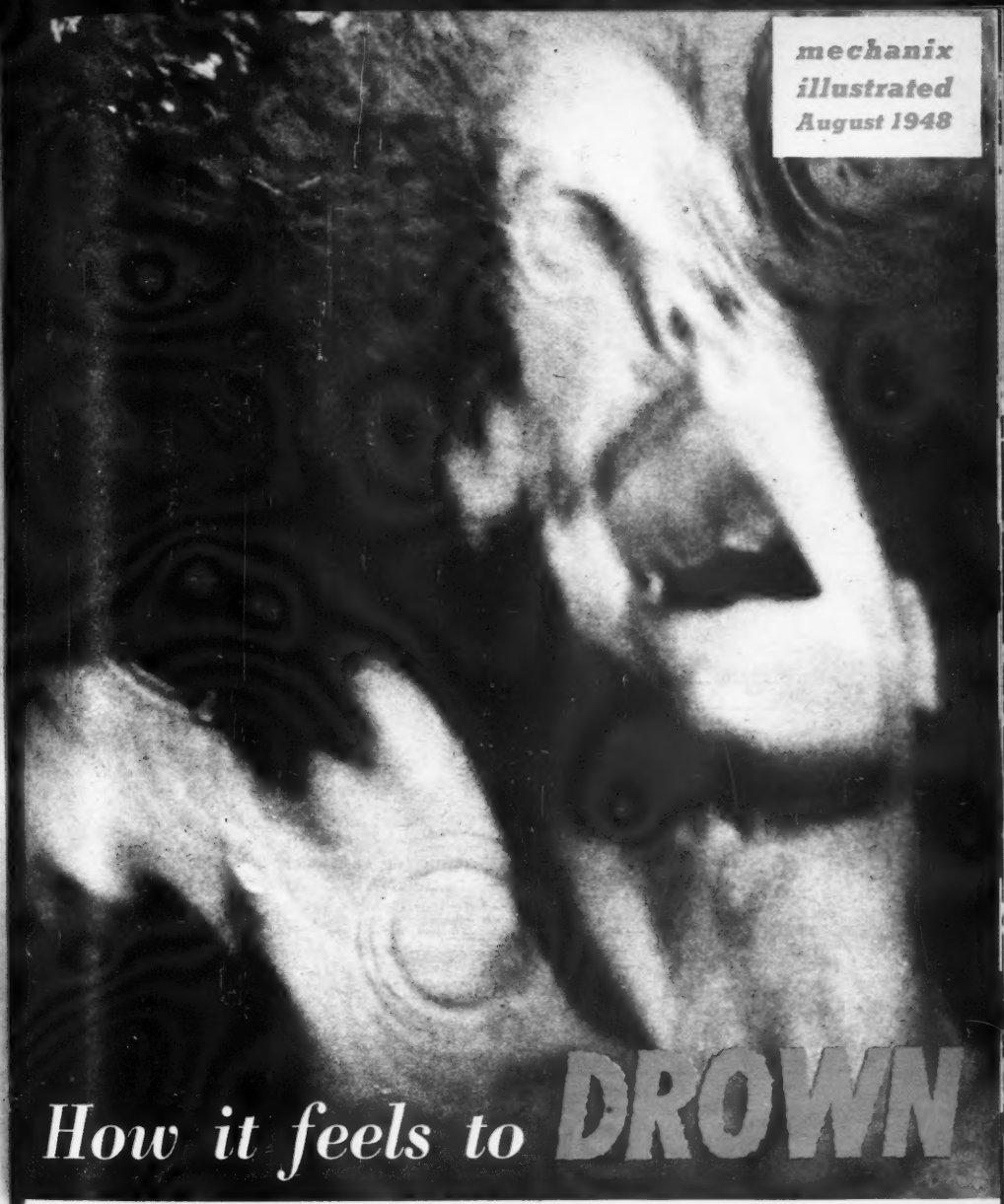


How it feels to DROWN

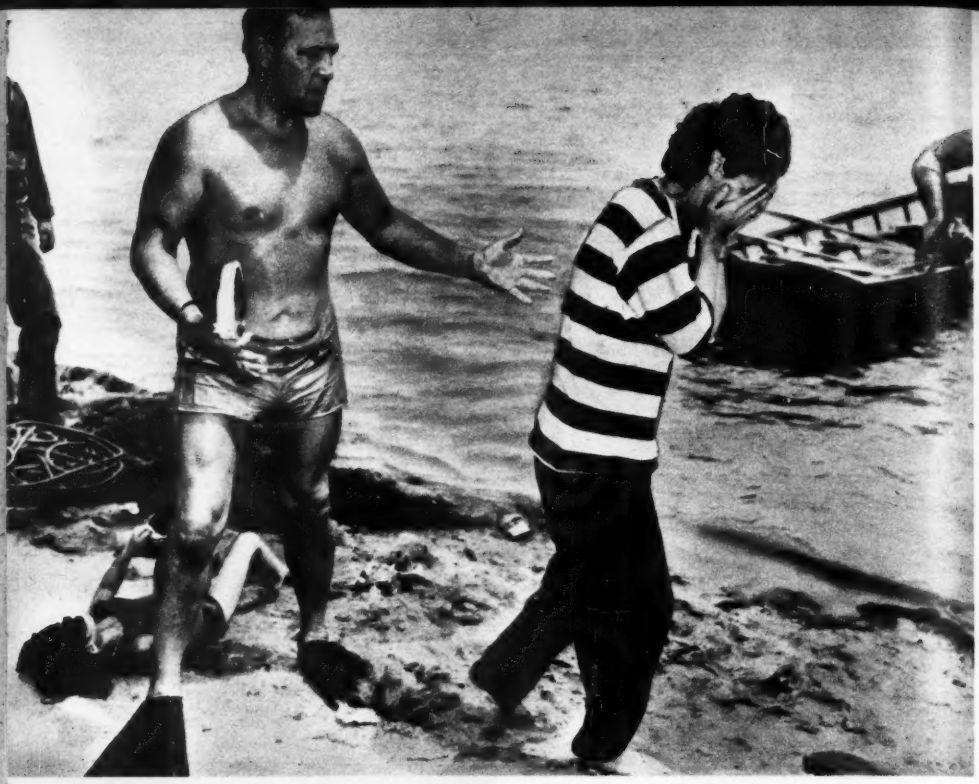
Photo by Harold E. Kelly

Last year 7000 Americans met death in the water. Here—in his own words—is the true story of one of them.

By Roger Burroughs

On August 27, 1947, I drowned in Sutton's Pond, N. C. In a few brief, terrible moments I found what it is like—to die. It happened like this. . . .

THAT Wednesday was a scorcher. Five of us—Herb Brunton, his cousin Earl, two other younger fellows and myself—had driven out from town for a swim. Even on



Mother sobs as she turns away from the drowned body of her seven-year-old girl.

Rescue was too late to save this lad, who found death in an old quarry.

the hottest days the water was always cool at Sutton's pond. It was a real mill pond, about 150 yards across by 200 yards long. On the steep south bank we had put up a diving board that bounced us out into 20 feet of water, the deepest part of the pond. We were careful to see that beginners stayed away from the board and did their paddling in the shallow water down by the old mill.

Herb and Earl, both good divers, tried to teach me to jackknife off the board. I didn't do so well. The board was too stiff, I said. Actually, I was leery of diving too deep. I didn't like the cold springs and the creepy weeds down on the bottom. Every time I started a dive that might whip me straight down in a good jackknife, I got queasy. I kept flattening out in the air and belly-whopping into the water with a splash. After a while, I gave up and climbed back to the top of the bank to rest.

The others soon followed

and stretched out on the grass. Pretty soon we were all dozing in the summer sun.

A big hound dog snuffled me out of my sleep. As I patted him I noticed some fat ticks around his ears and neck. I yanked them off but a couple popped and spurted dark blood over my hands. I slid down to the water to wash off the blood.

The diving board jutted out invitingly over the pond. I walked out on the board and bounced it up and down. The water looked smooth and black. When I jogged on the board, I saw myself mirrored in the pond. I didn't like what I saw—a skinny guy, gawky as a scarecrow. I tried to spring up from the board, gracefully the way Herb did. Not bad, I thought.

Suddenly I decided to try a jackknife. I looked back at the shore. The fellows were all asleep. Good. Nobody around to laugh at me if I flopped.

I made a short, quick run on the board—the way Herb had taught me—bounced once and shot into the air. It was a good dive. I snapped double, with my hands touching my toes, my feet tight together. As I started down for the water, the impulse to flatten out was strong but I forced myself to arch my back and straighten out cleanly. I knifed deep into the water. It was dark and icy. I got a shock as my bare chest scraped through some weeds. I jerked upward and pawed fast for the surface.

I gasped when I splashed above water, then looked around. Nobody was watching. I was glad the gang was still out of sight up above the bank. I [*Continued on page* 161]

Water clogs your nose, clamps your teeth tight when you drown. Here a lifeguard uses special device to open victim's mouth to life-giving air.

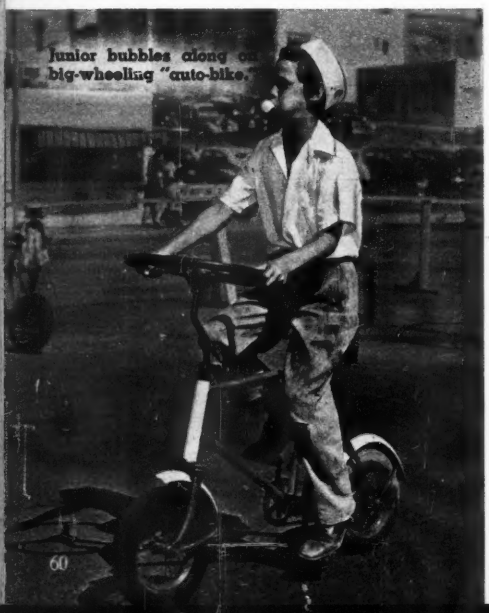
Panic blinds this sinking woman as rescuer swims up close to grapple for her life.

Life preservers from police river launch help the rescuer keep the victim afloat.

Safe at last, the rescued woman hangs limp from shock and exhaustion as two men on the launch haul her into the boat, back to life.

Cheer up, girls! Being behind this eight-ball is fun—if you get a push.

Funny-Cycles...New Fad



Junior bubbles along on big-wheeling "auto-bike."

"MUST be an easier way to earn a living," Walter Nilsson muttered as he nearly bounced off the stage on his square-wheeled bicycle.

For 20 years he had toured the country with his trick-bike act, but the falls grew harder and the scars took longer to heal. He ended his tour in Los Angeles and looked about for a quieter way to turn a dollar. As he began unloading a van of odd bikes he had picked up in his travels, he found his cycles had a terrific appeal for everybody in the neighborhood. When he set up some of his Funny-Cycles in a parking lot, the rush for rides swamped him. Soon he was manufacturing new gag bikes from barrels, eight-balls and spare wheels for "Funny-Cycle Rides" in other cities. The Funny-Cycle fad now has swept from the coast to Rochester and Binghamton in New York. Naturally, Nilsson's having fun, too—but he still can't see why anyone would hop across the street for a chance to fall off a crazy bike when life can be so beautiful without bruises. •

Bucking cyclist is riding for a fall on this Long-Tom bike with the off-center wheel up front.

Mother lets son do all the racing as they take a spin on side-by-side cycle.

Wheeeee! What's more fun than gals galloping along on cute little Funny-Cycles?

On, hello there, honey! Need any help with that big horse?

Beware of the invisible beast raging to beat out your brains whenever you're trapped in an emotional jam.

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BEAST UNDER YOUR SKIN

There's a savage ape man caged in your civilized self, ready to claw out your insides when you react to our modern tensions in the old jungle way.

BY DONALD G. COOLEY

LOOK out for lions on Main Street, leopards in your back yard, and pythons under your bed. You can't see 'em. Your good sense tells you they *can't* be there. But your body says they are, and it may decide to go to pieces when it sees a gremlin that isn't there.

Trouble is, there's a beast under your skin. Your civilized self has grown up around an imprisoned ape man, descended from primal days when your jungle ancestor had to walk softly and carry a big stick. You don't believe there's an ape man inside your better self? Well, why do you freeze to the spot if you see a snake coiled in your path? Why do your fists clench when somebody gives you the elbow? Why does your skin pale when you're frightened down to your toes? Why does your heart pound and your blood race when you get into an argument? You don't reason out these reactions—your body jumps into them in ways as old as the human race.

Doctors are beginning to blame your holdover jungle personality for some of your ills. The way they see it, our caveman kin wasn't much of a hand for deep thinking. What he needed for a grim survival was automatic defense machinery that would bypass thought. He had to dodge fast and be first to hurl the hatchet. He did develop a remarkable alarm-reaction system (otherwise your family tree would have died a sapling), but it isn't custom-built for civilized living.

There's high blood pressure, for instance. Dr. Stewart Wolf, Jr., of Cornell Medical College, recently told the American College of Physicians that this common symptom may be a costly hangover from primitive man. Anger and conflict jolted the old ape man into instant action. He could fight or run. His heart beat faster, blood pressure went up, digestion stopped as blood was pumped from abdomen to fighting muscles, and his liver poured out sugar stores for fighting fuel.

To this day your body reacts in the same way, quite independent of your improved brain, but you can't pop off the pressure by letting go with a stone axe. Your threat isn't a saber-tooth tiger but an insulting boss, a meager salary, a housing shortage, a mother-in-law—something you can't, or shouldn't, hit. So your ape man fights it out under your skin. If his rampages are frequent, the chronic tension clamps down on arteries. The heart then must work hard to pump the blood thus leading eventually to high blood pressure.

Many other ailments are linked to old hair-trigger emotions by the newer knowledge of psychosomatic medicine (mind plus body). In general, they are degenerative diseases of unknown cause, but there is impressive evidence that constant overstimulation can induce some body part to blow a gasket. Emotional tornadoes rip through the healthy as well as the ill. Diabetes, for instance, is a breakdown disease of the pancreas gland. The body cannot utilize carbohydrates and spills sugar into the blood and urine. Dr. Walter B. Cannon, an eminent physiologist, tested the urine of 25 members of the Harvard squad just after their toughest football game of the season. Twelve of them had sugar in the urine —five were substitutes who hadn't played!

Some heart ailments are associated with emotional overstimulation. Anger has even been charged with setting the stage for the common cold: when you're enraged, the nasal membranes swell and become congested, presumably lowering your resistance to cold bugs.

Naturally, you don't turn every emotional impulse into instant action, though primal man probably did (there were no jails then). The cerebrum, the modern thinking part of your brain, takes over and warns you how far you can go. "Brain storm" crimes show that the walnut-sized old brain of our primitive ancestors can at times overwhelm the new one.

You have just as much brute courage as the ancient ape man. Excitement and danger will bring it out in you. A thug carrying a club stalked a college student in a dark alley. The victim froze. Then the attacker made a

You'd look silly hurling a spear at a bus that threatens to run you down. Instead, you respond to your ape-man anger by hurling a jungle curse at the careless driver and jumping to safety.

mistake. He emphasized a command with a hard swipe of the club. The blow touched off the beast in the student. He lashed out with a fist. Then he sprang savage with fury on the thug as he toppled. If rescuers hadn't arrived, the student would have killed the battered holdup man with his bare hands.

Yet this same young man, even as you and I, would probably have sweated for a week anticipating a visit to his dentist. That's our "modern" brain taking over, making us flinch in advance, imagining the future, suffering things before they happen. This great big reasoning brain of ours makes it possible to worry, to suffer fears more colossal than the instant ones of the jungle.

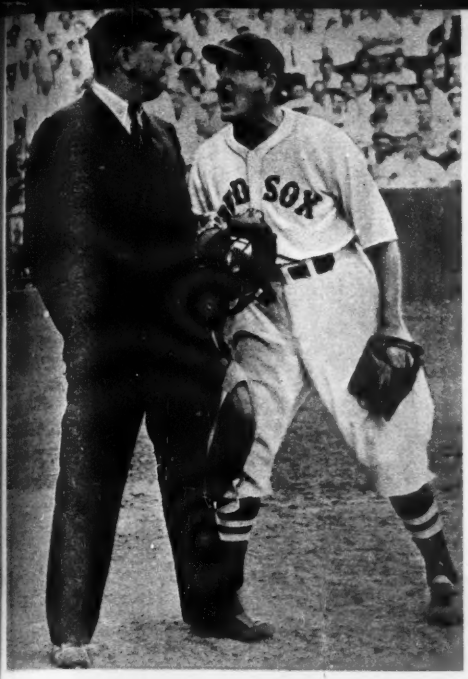
So we begin to see how what Dr. Wolf calls "primal hangovers" can lead to disease. We have to keep our ape man under cover. But a dozen times a day we may be irritated, enraged, made resentful or belligerent or worried, and the old defense machinery whips up our glands and heart and blood vessels without really being discharged. Constant overstimulation may break us down at a weak point, overloading parts of the body machine.

You need both your savage and civilized personalities to get along in this world. Your reasoning brain enables you to make good on the job, or at least keeps the other fellow from short-changing you. Your stone-hatchet self keeps you from being a human doormat and jolts you into action on important occasions when you must act without thinking.

Control isn't easy, but psychologists have charted helpful pathways to peace of mind. Fears diminish when they are faced down. Our skin quits crawling when we advance on the "ghost" in a dim room and discover it to be a curtain billowed by a breeze.

Don't brood over things that rouse hostilities. Take action, say the psychologists. Action is a great cure for worry. It gives our driving ape man something to do, drains tensions. A great deal of anger that makes the body simmer and builds up pressures beyond the capacity of our boilers disappears if we keep our battle-axes sheathed.

The art of relaxing is wonderful in banishing harmful tensions. Your arms and hands that hold this magazine will be a little tense. They have a job to do. But what about the rest of your body? Try this test: as you sit reading, think about the muscles in your toes, your thighs, your torso. Tighter than they need to be, aren't they? Let them go limp and feel the difference. This is the principle of progressive relaxation taught by Dr. Edmund Jacobson. Practice conscious relaxation of successive groups of body muscles. Learn that, and you'll learn to do away with much of the tension that keeps the beast charging around under your skin and knocking you out before your time. •



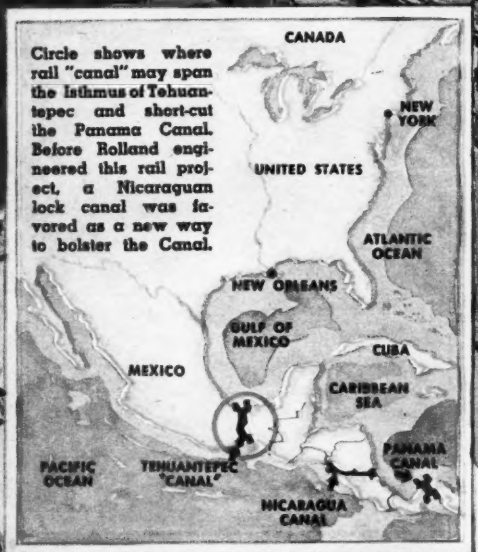
The ballplayer arguing in a hot rhubarb with the umpire shows a civilized equivalent of the caveman spearing the bear.

The gentleman in the chair seems to have taken a tip from the cute kitty on what to do about tension—just relax.

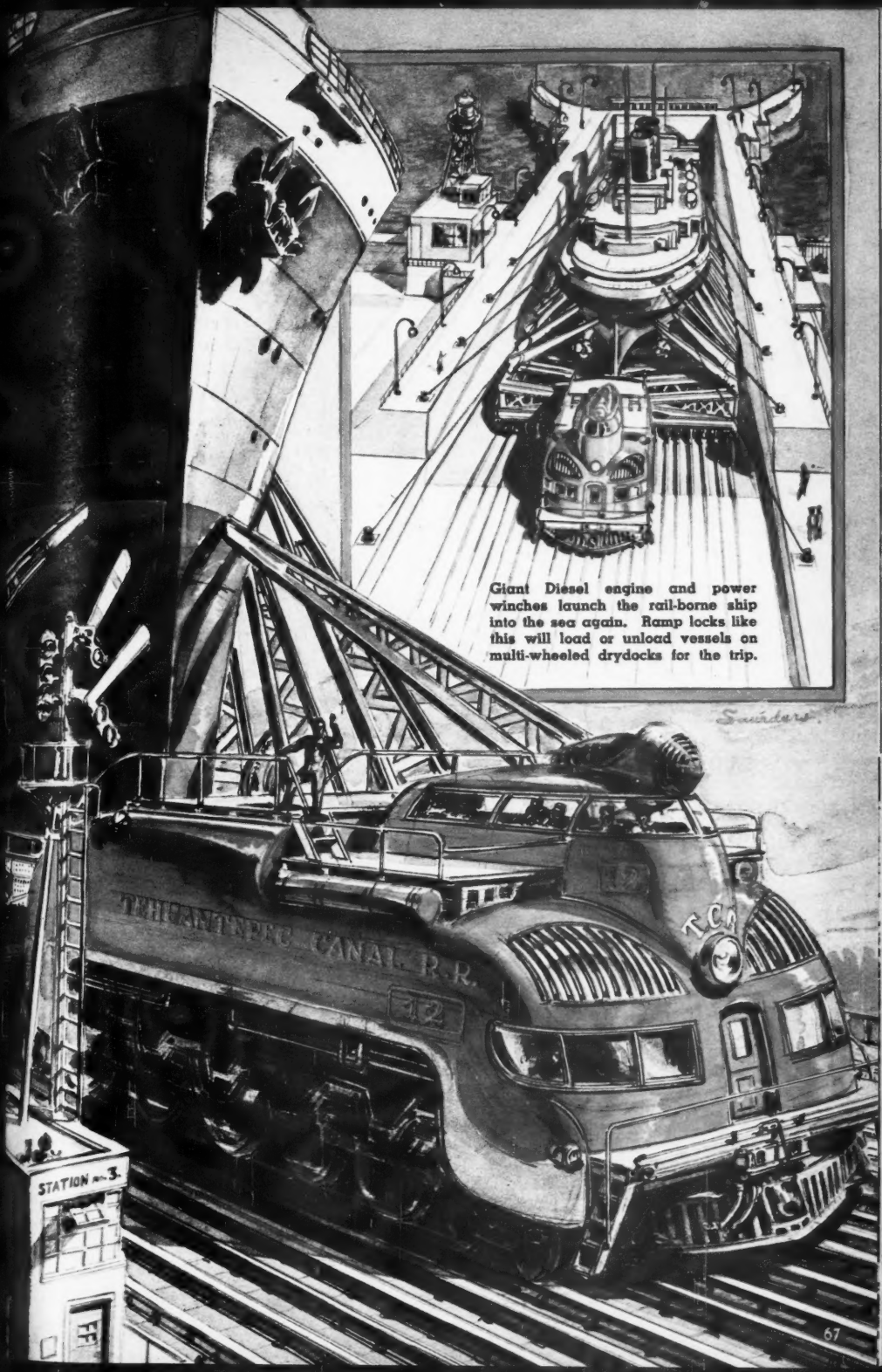
Rail 'Canal' Across Mexico

THE ocean liner slips into a strange dock on the Pacific coast of Mexico. Slowly the ship looms up out of the water, then sails across the dry land. Twelve hours and 156 miles later the ship splashes into the waters of the Gulf of Mexico, across the continent.

That ship's no mere mirage shimmering over the hot, arid land south of the border. Overland voyages by ship will soon be as regular as a train schedule, according to Modesto Rolland, big-time Mexican builder. And he isn't just hopped up on those jumping beans, amigo. President Aleman has commissioned him to work on a $240,000,000 plan for a 20-rail "canal" to float ships across the Isthmus of Tehuantepec. Powerful Diesel locomotives will shuttle the ships in dry-docks-on-wheels from one ocean to the other five times as fast as they would move through the Panama Canal. Not only is Tehuantepec much closer to the U. S. than Panama, but the climate's healthier—in war as well as in peace, since a railroad can be repaired much quicker after bombing than our vulnerable Big Ditch.

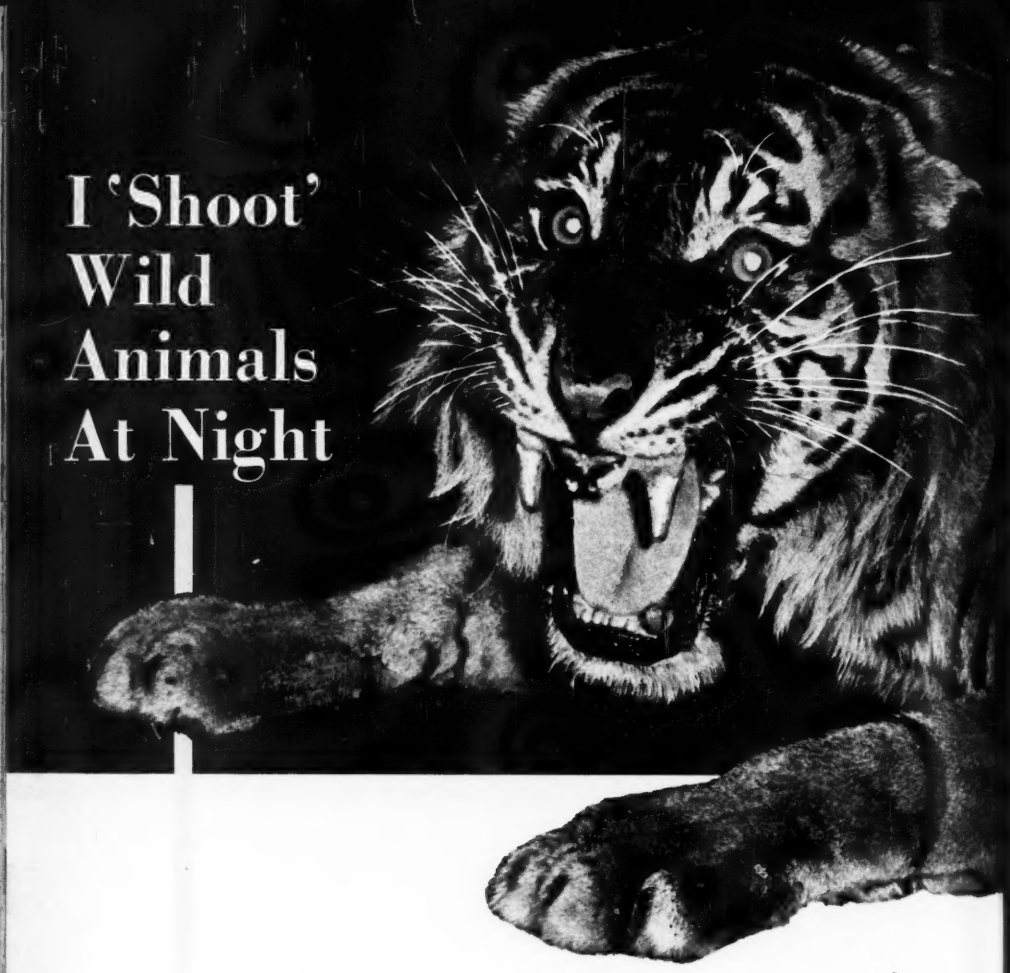


Circle shows where rail "canal" may span the Isthmus of Tehuantepec and short-cut the Panama Canal. Before Rolland engineered this rail project, a Nicaraguan lock canal was favored as a new way to bolster the Canal.



Giant Diesel engine and power winches launch the rail-borne ship into the sea again. Ramp locks like this will load or unload vessels on multi-wheeled drydocks for the trip.

I 'Shoot' Wild Animals At Night



By Bob B. Ford

as told to Hal H. Harrison

IT'S against the law to shoot big game at night but I've done it for ten years, not only with the approval of the authorities but with their wholehearted cooperation. You see, I do my shooting with cameras, not guns.

Night photography started as a hobby for me while I was engaged in the automobile repair business in Homestead, Pennsylvania. I became so interested that today it is my full-time work. My lectures, illustrated with motion pictures and stills, have furnished the financial backing for other adventures.

And adventures they have been—those nights spent in Pennsylvania's Allegheny Mountains, in the frozen wastelands of the far North and in the sweltering jungles of Mexico. I have stalked mountain lions and great herds of white-tailed deer. The majestic elk has been enticed into taking his own picture with my remote control system. Ocelots, bears, raccoons, foxes—all have been lured within range of my waiting cameras.

It is thrilling sport in the dark forests, waiting to snap the shutters of cameras that record the nocturnal habits of wild animals. But for practical purposes I have found that permitting my quarries to photograph themselves is more desirable. My method is quite simple and one that anybody can employ. It's merely a case of the animal touching a pre-arranged spot, thereby closing a battery-controlled circuit which fires a pre-focused camera and

a synchronized flashlamp.

Let's take that picture of a bull elk as an example. Knowing these big animals are very curious, I figured that a tin can placed at the top of a stick would command his attention. A bit of salt rubbed on the can would make him doubly interested.

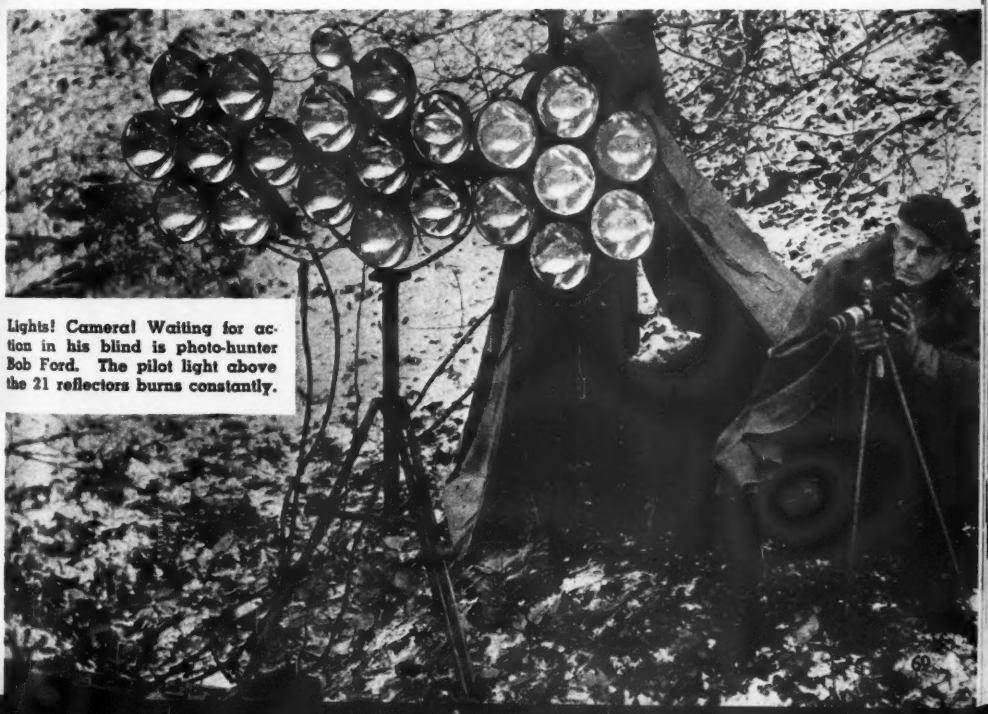
Self portrait is taken by this doe as she breaks a thread, stretched across the fence, which releases the shutter of Ford's camera.

Under the can, I placed one wire inside a loop at the end of the second wire. Any movement of the can, such as an elk nuzzling it, would cause the two wires to touch. This would complete a circuit running to a magnet at the other end of the wires. Tripping the magnet would fire the camera through the battery case of the synchronized flash holder. The camera, encased in a weather-proof metal box, was attached to a tree bracket. The flash gun was also attached to the tree.

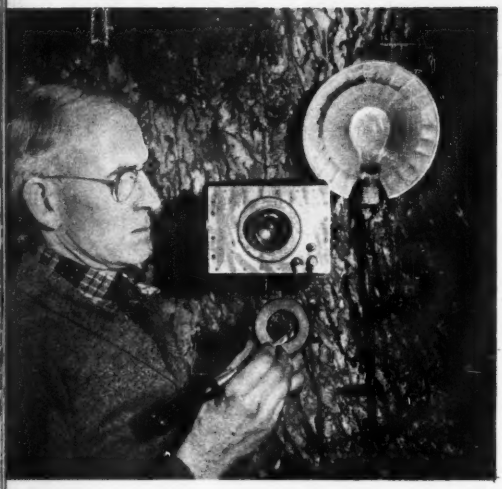
One morning when visiting this "set" I received quite a shock. I hadn't figured the same curiosity that caused the elk to nuzzle the can might also attract him to the camera. I found the camera and the flash on the ground, battered by the mauling that the big fellow had given them.

Once I developed my negative to discover that I had a picture of a deer several feet away from the wire trip. The only plausible answer here is that the elk took the deer's picture. Probably the elk had nuzzled the magnet near the camera and fired the apparatus as a deer stood in the line of the picture.

On another occasion I arrived to find the camera fired. Returning to my darkroom I anticipated a picture of a bull elk. Imagine my surprise to find that my negative contained the image of a young boy. This lad had been



Lights! Camera! Waiting for action in his blind is photo-hunter Bob Ford. The pilot light above the 21 reflectors burns constantly.



Here Ford sets the magnetic trip which closes the shutter when the quarry nuzzles the tin-can decoy.

curious about the strange set-up, just as the elk had been. I had a shot of him inadvertently firing the camera as he touched the two wires with his foot.

White-tailed deer ordinarily do not permit their curiosity to overcome their instinctive fear of strange objects, so the tin can set did not work well with these animals. A mineral lick or salt lick, placed long in advance so that the deer became accustomed to it, served as my best decoy. Threads were run across the deer's well-worn paths and fired the camera when they were touched.

I used this thread method quite successfully on an old she bear who gave me a great thrill. It was late in the winter, time for the bears to be coming out of hibernation, and I was looking for a den where a female and her newly-born cubs were hiding. Peering into the dens of black bears when the occupants are asleep is one thing. But shoving your head into a den where a mother bear is very much awake is another. I did it. The old bear made one lunge for me and then stopped. Yes, she was bluffing but it was hard to convince myself that it was just horse-play when the hungry, full-grown mother bear made a leap for me. I got away fast. But it was that old black bear that gave me one of my best pictures of a bruin.

All my life I've been fascinated by the habits of our wild animals. I'm happiest when afield watching them feeding, playing, fighting, running—living their lives unmolested. Were it not for this love of the out-of-doors, I probably could get more pictures in less time.

How well I remember that below-zero night high in the Allegheny Mountains. I was sitting in front of a cabin on a stool with heated bricks beneath me, waiting and watching for deer to come close to the corn I'd placed for them. They were suspicious. They had my scent but they were hungry. I didn't move. Finally, two fawns bounded ahead and started to feed on the corn. I was ready to push the button of my remote control when suddenly a doe edged toward her young ones. Cautiously she approached until she was along side of them. Then, with her feet she began to shove them back and away from what she felt was danger. I was so enthralled with what I was watching that I almost forgot to fire the camera. I caught the doe with one fawn before they had backed out of range.

The coldest weather I've ever worked in? I remember it very well. North of St. John's Lake in Quebec Province one winter, it was 38 degrees below zero. I waited until it warmed up to 25 degrees below zero and then shot a picture of the thermometer.

Recently, I've been interested in taking color motion pictures of animals at night. The problem here, of course, is to have sufficient light to record the subjects. With light provided, the next problem is to get the animals accustomed to the brightness so that they will perform without any inhibitions.

Originally, I carried in my car a complete generator for floodlights. Using power from the car engine, this machine was capable of generating sufficient current to operate two 1000-watt floods. There were several objections to this method. One was the fact that the running motor caused the animals a great deal of alarm. Also, the car had to go with the lights. Finally, the generator required the services of a second man in the car.

Now, I use a home-made board of 21 lights, operated from three 3-celled storage batteries. The board is lightly constructed in three units of seven lights each. Each light is made from a single automobile headlight reflector and each burns a 50-candlepower V-type filament, which gives a much rounder pattern than a sealed-beam headlight. It also gives several times the power of a sealed-beam unit. Each light and each bulb is adjustable for various angles.

With this set-up, I use a single pilot light of three to six candlepower, operating from its own storage battery. This light burns all the time and accustoms the animals to moving about within a lighted area. I have found that when I throw the switch for the brilliant 21-light circuit, animals are usually not conscious of the increase in light power. A moving light will scare them. My lights remain constant.

I'm often asked about my greatest thrill—

Curiosity snaps an elk. Below, Ford wires the can which the bull investigates, above. This completes the circuit which fires the camera.

my most dangerous assignment or my narrowest escape. The answer does not involve bears, wildcats, savage bull elks on the rampage or any of these rugged creatures. A bird gave me my most worried moments during my ten years of work with wildlife.

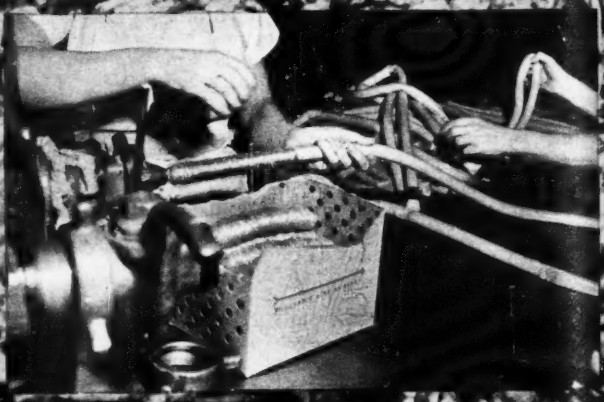
It was a goshawk—that powerful, fearless member of the Accipiter tribe, the big brother of our chicken hawks. I found her nest high in a tree in northern Pennsylvania and my first job was to climb the tree and check conditions.

I was half way up when Mrs. Goshawk made her first lunge at me. From high above she came down like a rocket, wings folded as she screamed her defiance. She struck me hard with her breast bone and then raked my head with her talons as she zoomed upward. The cap I wore offered little protection. Her sharp claws tore right through it and drew blood.

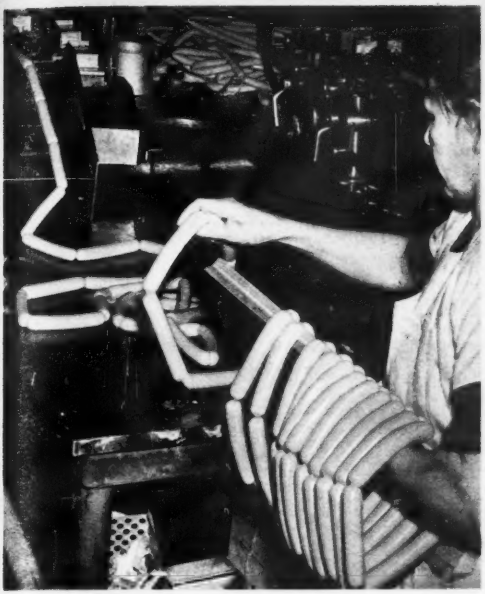
When I had recovered from the shock, I started to climb again. And again she struck, drawing blood from my shoulder this time. On up the tree I went. Then, for the third and last time she came [*Continued on page* 158]

BIRTH and DEATH of a HOT DOG

Meat flows like custard in an unending stream from the grinding machine. Then, into the silent mixer, left, where the ground meat and spices are whipped to a soft paste.



Through the "stuffing horn" goes the frankfurter paste. The artificial casing wriggles like a snake as the piston forces the mixture into it.



No missing links here! This machine automatically measures off each frank and ties it into the familiar shape. Americans gobble up more than 10 billion every year.

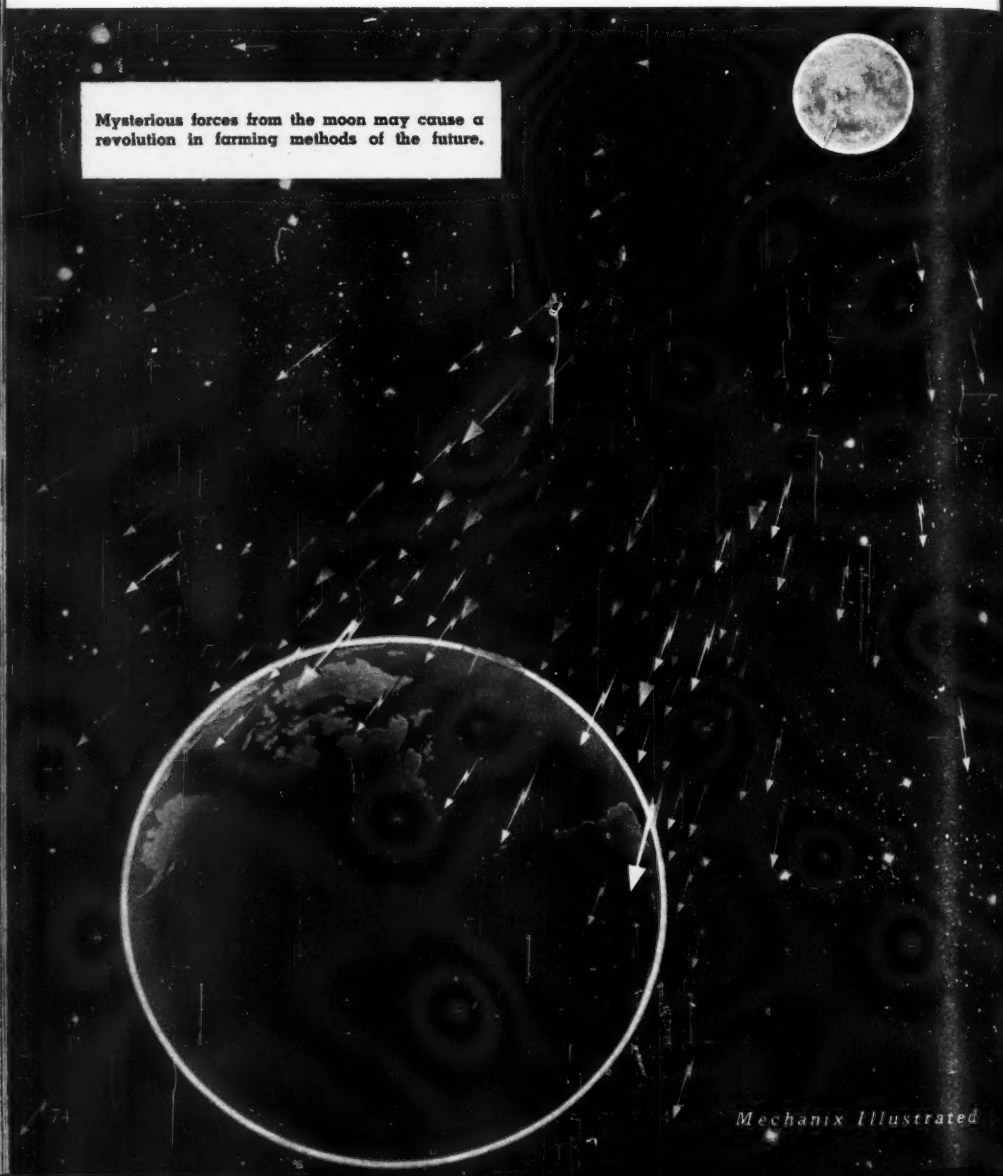
All frankfurters are pre-cooked. Here, a worker moves a rack of processed weenies from the factory steam oven. Next stop: Coney Island!

Portrait of a girl about to kill a hot dog. Can you think of a pleasanter way to die?

Can Moon-Power

Yes! says Madame Lilly Kolisko, Austrian natural scientist whose astounding experiments are revealed in this article.

BY K. R. BATTEN



Mysterious forces from the moon may cause a revolution in farming methods of the future.

Increase Crops?

IS the farmer who plants by moon phase a superstitious old hayseed or is he using a scientific method?

Back in the days when Rome was the capital of the world, most farmers believed in sowing their crops according to the phases of the moon. But, then, they also believed that the world was flat.

With the rise of education came scorn for the theory. "The moon is a dead planet," scientists said. "It generates no light of its own and the idea of this planet exerting force of any kind on the growth of plant life is unsupported superstition."

But still some "superstitious" farmers continued to plant by moon charts—often getting surprising results. Then, in 1925, Lilly Kolisko, a famed natural scientist and follower of philosopher Rudolf Steiner, began her series of experiments in the field of moon-power. She found that the moon exerts a definite physical force on the earth which stimulates plant life during certain of its phases. And she has scientific data to back up her claims.

Two days before New Moon. Two days before Full Moon.

Authentic photo of the tomato plants grown by Madame Kolisko is shown above. At right, scientific moon-phase planting may be able to produce tomato plants on every farm as large as these 14-footers.

FARMER'S DREAM: 17-foot corn, above, may become a reality if the Kolisko theories prove true. Stunted fields of corn, above right, may be a thing of the past in an age of carefully planned moon-chart planting.

Contrast between New Moon and Full Moon planting is revealed in this actual picture of Madame Kolisko's green kohlrabi experiment.

Two days before New Moon. [illegible]ays before Full Moon.

Scoffers are finding it difficult to shrug off her findings.

Madame Kolisko's experiments began in October, 1925. She sowed wheat grains in glass jars at each phase of the moon—New Moon, First Quarter, Full Moon and Last Quarter. After two weeks, each plant was measured and weighed. It was found that the largest plants were those sown in the waxing phase of the moon (from New to Full Moon). The smallest were those sown during the waning phase (from Full to New Moon).

As the experiments continued, an interesting point was observed—in November the first leaf of the tiny plants grew longer than the second leaf. The same held true in December. It wasn't until January that the second leaf began to grow longer again. Madame Kolisko discovered that this difference in growth coincided with the seasonal forces. The sequence of the months and the intensity

of the sunlight had to be taken into account, too. In the winter months, when the growing power of the sun was at its lowest, the first leaf grew longer. In the other months, when the light-intensity was highest, the second leaf grew longer. In every month except April and December, the greatest growth occurred between the New and Full Moon periods. In June, July, and August, when the light-intensity was already in the waning phase, the greatest growth was recorded for the entire year.

With all these variables arising, Madame Kolisko decided to conduct further tests to prove that moon-power was not merely a part of the sun's light-intensity. She grew plants in a dark room and even here the greatest growth came during the waxing phase of the moon—the two weeks between the New and Full Moon. Satisfied that the moon had a very definite effect on plant life, she decided to expand her experiments farther.

She planted several plots of corn two days before the Full Moon and several plots during the Full Moon. In a short time, seedlings had broken through on all plots sown two days before the Full Moon but none from those planted during the Full Moon. In fact, the latter did not come through until the eighth day. After more experimentation, she discovered that plants must be sown a few days before the Full Moon if they are to receive its maximum effects. She concluded that it is necessary to plant with the waxing moon rather than the waning moon. At this time, an East African farmer who was also testing moon-phase planting methods wrote to her that "During two maize crops, I have found the fact continuously proved that corn planted with the waxing moon yielded 30 to 40 per cent more than that planted in the waning moon."

Between 1926 and 1935, Madame Kolisko conducted an exhaustive series of experiments with vegetables. She planted cabbage seeds two days before the Full Moon and two days before the New Moon. All the seedlings planted two days before the Full Moon germinated and showed vigorous growth. Those planted two days before the New Moon were irregular and smaller. At the time of transplanting, the Full Moon plants were far ahead of the New Moon plants even though they were two weeks younger. At harvesting time the Full Moon plants were three times as heavy as the others and their yield was 30 to 40 per cent higher.

Beans sown two days before the Full Moon appeared two days before the New Moon seeds which had been planted two weeks earlier. All the Full Moon seeds germinated while 30 per cent of the New Moon crop failed. When gathered green it was found that the yield was 50 to 60 per cent higher for those plants sown just before the Full Moon. One strange fact—if left to ripen fully, there was little difference between the yields.

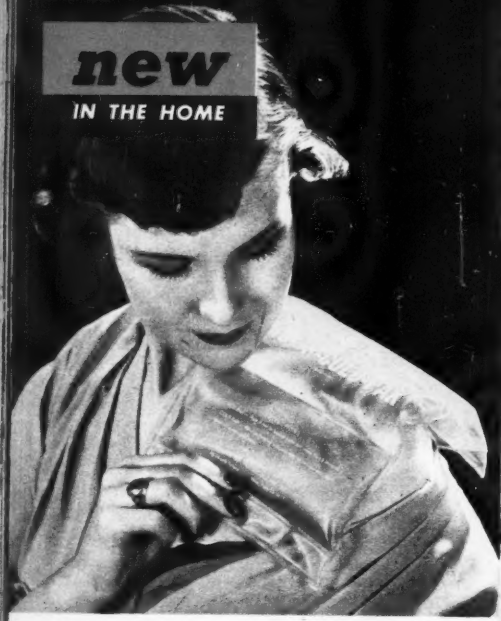
In the same type of experiments with tomatoes, it was found that Full Moon tomato plants showed a yield 30 to 60 per cent better than New Moon plants. They bore juicier fruit, too.

Similar experiments were carried out with radishes, beets and carrots. And in all cases, the results were almost the same. Vegetables planted two days before the Full Moon had better foliage and roots, were better tasting and sometimes had as much as a 60 per cent increased yield. Those planted two days before the New Moon were inferior in both quantity and quality. [*Continued on page* 166]

moon phase calendar

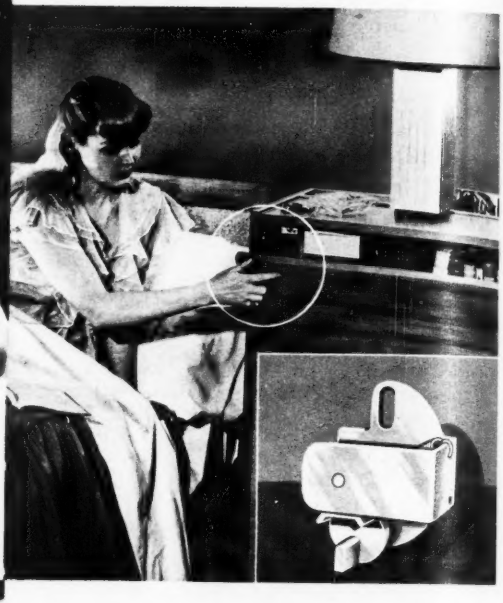
month	new moon ●	first quarter ◐	full moon ○	last quarter ◑
july	*6th*	*13th*	*20th*	*29th*
august	*4*	*11*	*19*	*27*
september	*3*	*10*	*18*	*26*
october	*2*	*9*	*17*	*25*
november	*1 and 30*	*8*	*16*	*23*
december	*30*	*8*	*16*	*23*
1949				
january	*28*	*7*	*14*	*21*
february	*27*	*6*	*13*	*19*
march	*29*	*7*	*14*	*21*
april	*28*	*6*	*12*	*19*
may	*27*	*5*	*12*	*19*
june	*26*	*3*	*10*	*18*
july	*25*	*3*	*10*	*18*

new
IN THE HOME



Frozen Heat, above, is a combination hot-water bag and ice pack. It's a Vinylite plastic bag filled with a special liquid which you can cool in your refrigerator or heat in hot water.

Tutch Latch, below, is a replacement for your cabinet door knobs and drawer handles. A touch of your finger or elbow on the panel releases the catch and permits a spring hinge to swing the door open.



Speedy Weenie, above, takes less than two minutes to prepare in this Bakelite electric cooker. Closing the lid serves as a switch to send the current through the hot dogs.

Cigarette Lamp, right, looks like a miniature lighting fixture but it's really a tobacco dispenser. When you press down lightly on the shade the cigarettes fan out for instant use.

THIS MONTH'S

prize gadget

Collapsible Tripod

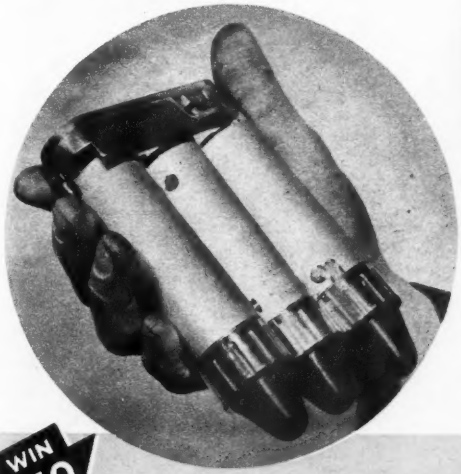
SOMETIMES it pays to daydream about the happy days of your childhood. Ask Wolcott Kinnard of Milwaukee, inventor of the pocket tripod he's setting up at the bottom of the page.

A while ago Kinnard recalled the fun he had as a kid playing with an old roll of movie film. When he pulled out the center of the roll, he found he could telescope the film neatly back and forth in a spiral tube. Memory of that smooth-spiraling little tube of film made him think of all the big, awkward tripods he'd lugged around with his camera—first as a photo-hungry shutterbug, then as a pack-worn Marine toting the three-legged platforms about the Pacific for a photo unit. Now, if he could make the film tubing strong enough. . . .

Kinnard, who had already put himself into the photo-equipment business by inventing an enlarging meter, tinkered with tubing in his plant. When he tried his film-roll trick with a coil of stainless steel, he had the answer to his tripod troubles.

A few months later he completed a practical model with a locking device for each spiral leg and set up the tools for turning out his collapsible tripod in quantity.

In 30 seconds you can set up the Kinnard tripod for anything from a 5½-inch "worm's eye" view to a six-foot shot over the heads of a crowd. A few turns of the spiral's tip locks each leg at the height you want it. A twist of the wrist in the opposite direction unlocks the spiral again so you can collapse the legs back into the holder and pack the whole tripod in your pocket. For the slickest trick of the month, MI is spiraling Kinnard a $50 check in the mail. •



WIN $50

Dreamed up a neat gadget? Send pictures and a description of your favorite invention to Gadget Editor, MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Each month the best entry, in the opinion of MI's editors, will be awarded a prize of $50.

The Tucker has that sleek, underslung look. You know it's built for speed.

A MECHANIX ILLUSTRATED Exclusive!

We Drive and Test the New TUCKER Car

BY TOM McCAHILL

TUCKER is building an automobile! And brother, it's a *real* automobile!

I want to go on record right here and now as saying that it is the most amazing American car I have seen to date; its performance is out of this world. Why do I think so? Wait until you have had an opportunity to drive the car and you'll know what I mean.

Probably no other new product in America's industrial history has received quite as much ballyhoo and attention as the Tucker. It has been subjected to Senate investigations, SEC inquiries and thousands of uncomplimentary rumors. In this writer's opinion, the entire automotive industry has rated the Tucker as just one of those things out of the comic sheets, fun to talk about but strictly a product of the "never, never world."

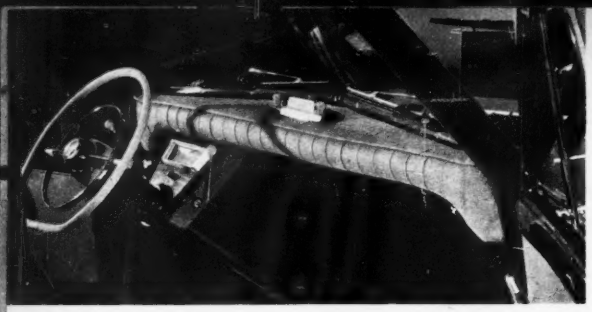
From coast to coast I have talked with automobile men and whenever the subject got around to Tucker, smiles and guffaws were always in order. I was told by men who said they had it right from the horse's mouth, that Tucker was in an engineering jam because he couldn't figure out a way to get a reverse gear into the car. I was told by others that his only car had a Mercury engine under the hood.

Yes, I was told many other similar things and frankly, I was just as doubtful as the rest. I contacted the Tucker organization on numerous occasions, trying to get a true story for these pages, with no success whatsoever. Finally Mr. Parsons, director of publicity for Tucker, gave me a green light and I packed my cameras in a hurry.

The Chicago factory, which is one of the largest in the world, was a beehive of activity. For the record, here's what I saw: at least 2,000 men working on a moving production line, nearly 200 cars in various forms of completion, and the huge paint and drying enclosures running at full tilt on new bodies. To sum up, Tucker was

The Tucker's face has an extra eye, right in the center. It turns with the steering wheel.

Here's the rear, quite as startling and unconventional as the front. Note the six exhausts.



Note special crash-safety compartment on right side. Padded dashboard has no instruments but lots of room underneath.

Where's the engine? It's not up front, Tom discovered. It's in the rear, leaving the front free for lots of baggage.

Here's proof that Tucker is making cars: a production line.

definitely building automobiles.

Then I got a real surprise! I had my first ride in a Tucker. I was amazed at its comfort and the way it rode over bumps and railroad tracks with the ease of a cloud passing over a mountain. I took picture after picture. The engineer lifted the hood and showed me the engine—but first I had to give him my word I'd lock my camera.

It is a six-cylinder, double-opposed, pancake job, water-cooled and not unlike a number of pancakes of the past. It is rated at 150 hp but dynamometer tests show 177.

Then I drove the car! The pre-select shift worked well and the car took off like a comet. After several acceleration runs I stopped and tried the reverse gear. The Tucker does back up! Leaving the plant grounds, I went up to Cicero Boulevard on the south side of Chicago, and I soon knew I was in one of the *greatest performing passenger automobiles* ever built on this side of the Atlantic.

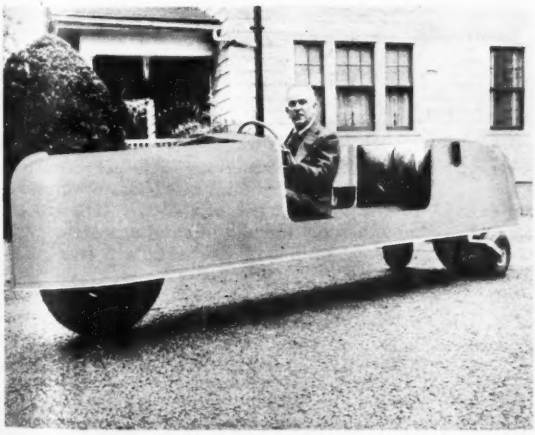
This car is real dynamite! I accelerated from a dead standstill to 60 miles an hour in 10 seconds. Then I saw an open stretch ahead and I opened the throttle wide. In no time at all, it seemed, we were doing 90 on the clock, 95, 100 and then 105—miles an hour, that is! And we were still climbing when a truck loomed up ahead and I had to kill speed. This was the quickest 105 miles an hour I have ever reached. I have gone 105 before in foreign cars but none of them ever got there that soon.

The car is roomy and extraordinarily comfortable. It steers and handles better than any American car I have driven. As to roadability, it's in a class by itself. I'll really get out on a limb and say that if this car will stand up and prove reliable, it will make every other car made in America look like Harrigan's hack with the wheels off. The car I was driving might start coming apart in 50 miles—that I don't know. But you have my word for it, when I was driving it, it was tops. •

new IN SCIENCE

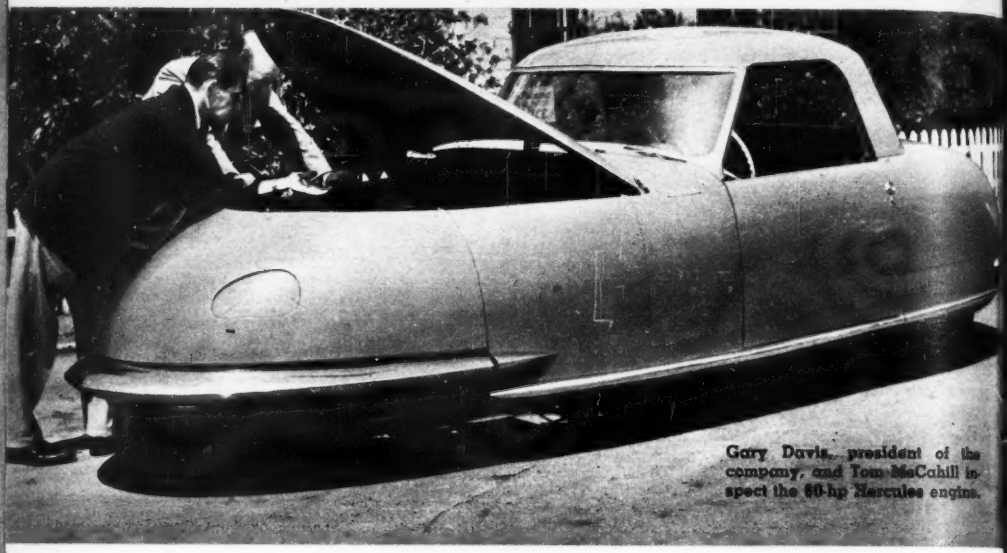
Spaghetti On Wheels is the curious result of an engine explosion on the Chesapeake and Ohio Railroad. The flue pipes of the locomotive's super-heating unit burst into this twisted mass of tubes. Two crewmen died of burns and a third was injured in the Chillicothe, Ohio, accident.

Auto Becomes Bike, below, when it reaches a speed of six mph. The side wheels lift two inches off the ground, making the car into a two-wheeler. It's a 25-hp rear-motored vehicle designed by 65-year-old Albert A. La Pointe.



Chopper Shopping? If you've only gums where your teeth should be, these gadgets may solve your fitting problem. They're condylometers for accurately measuring the bite of people who need false teeth.

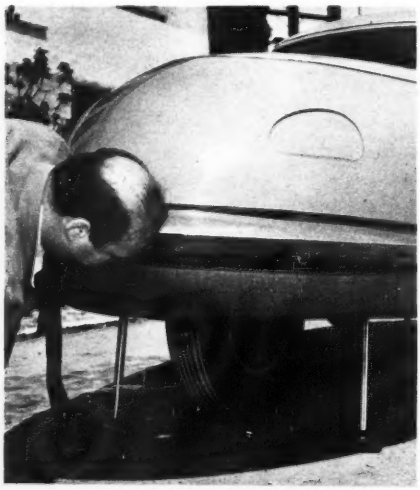
MI Tests the 3-Wheel



Gary Davis, president of the company, and Tom McCahill inspect the 60-hp Hercules engine.

Here's a $1000 car that not only turns on a dime but parks on it. Tom McCahill says it's in a class by itself for agility if not for smooth riding.

Flat tires are a cinch with these sweat-saving hydraulic jacks operated by push button. Notice headlight lids on the front of the streamlined hood.



IF your girl friend happens to have two heads, you'll probably appreciate the public's reaction to the Davis 3-wheel car. It's regarded as a complete curiosity —a modern-age freak.

But it should prove more of a sensation when it finally goes on sale because it's scheduled to sell for less than $1,000. And it's in a class by itself for agility and ease of handling plus good looks.

When I arrived in California last winter, Davis was giving demonstrations inside the factory for the sole purpose of selling franchises in order to raise enough money to go into full production. The performance I saw was sensational but I wasn't allowed to get within reach of the car. The model was the one finished job and was scheduled to leave on a barnstorming trip from San Francisco to Chicago. When I returned to Van Nuys recently, manufacturing operations were under way and I got the green light to go ahead. My test was convincing.

First, I went around and around a room 200 feet square at speeds close to 60 mph.

DAVIS

Next, in a much closer circle, I cut the wheels fully to the right and spun around at speeds close to 45 mph in a space not much larger than an average bedroom.

This car has such amazing turning ability that I could head for the factory wall at close to 60 mph and spin the car around on its rear wheels within inches of the wall, simply by whipping the steering wheel to the left or right.

It's one car you can actually park on a dime. The car is 15 feet 8 inches long and you can park in a space only two inches longer than its overall size. All you do is forget the front, back in where there's room and then cut the front wheel to a right angle position. The front end will go to the curb without the rear moving backward an inch.

Unfortunately, the car I tested rode like a bucking broncho with the hiccups. It was explained to me that the shock absorbers and springs of this test car were not adjusted correctly, but even considering these facts it was still a rough ride. The trouble can probably be traced to the tubular frame used in the original model. I was glad to see that the new cars being built on the assembly line had channel-type frames. So it is fair to assume that the production line Davis will be a smoother riding car.

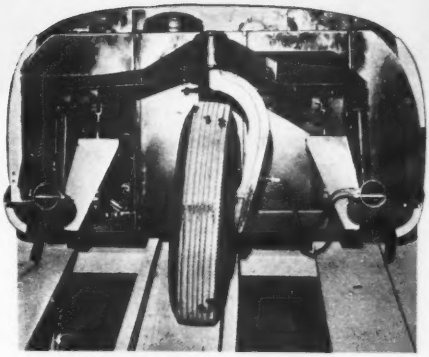
As for speed, I take Davis' claim, that the car will make 116 mph, with a grain of salt. I'd have to be doing the clocking on this 60-hp. engine before I'd accept that figure. I think about 100 mph would be closer.

You married men can breathe easy—there'll be no back seat driving in the new Davis. This driving hazard has been eliminated by the simple expedient of doing away with the back seat. The front and only seat is 64 inches wide. There's plenty of room for four adults. The entire body is made of aluminum and the approximate weight is 1,500 pounds.

You can count on getting 35 or 40 miles on the gallon from the four-cylindered, 60-hp. Hercules engine. Hercules, an old line manufacturer, is the buyers' assurance of engine reliability.

The three-wheel brakes are hydraulically operated. The car also has four hydraulic jacks worked from inside the cabin door in the best British manner. The doors, by the way, have push buttons instead of handles.

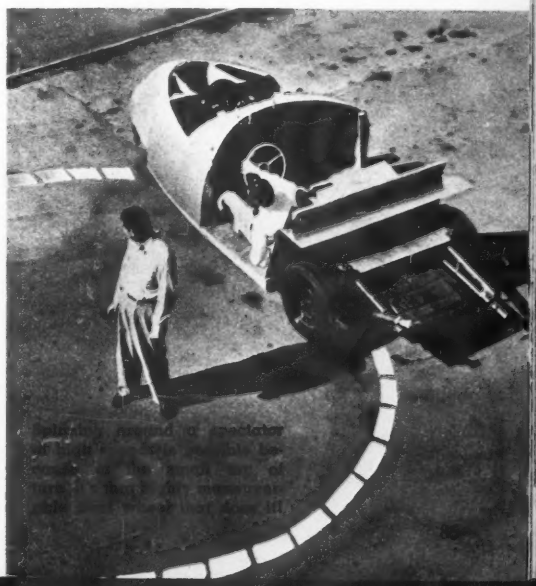
In addition to a conventional speedometer, the Davis has a tachometer for accurately measuring high speeds.



It's startling under the hood, too. This production line front view of a stripped chassis makes it look like a top-heavy motorcycle.

"Will it turn over?" is a question most people ask. Sure it will. But so will any other vehicle only the Davis won't do it quite so easily. I have gone into sharp turns and spins in the Davis—that would have caused many well known autos to roll over. After all, most of our giant airplanes utilize the three-wheel principle for landing gear because they find the triangle superior to the rectangle in resisting roll-over tendencies.

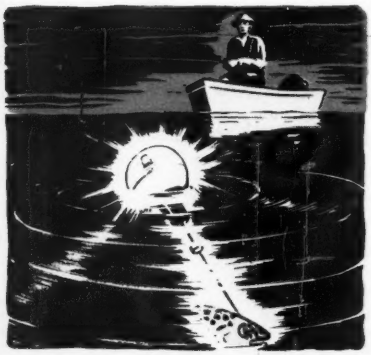
The state of California may have given the car a bit of set-back by passing a regulation requiring Davis cars to register as motorcycles since they have less than four wheels. It may have a psychological effect on prospective buyers. But automobile or motorcycle, the 3-wheel Davis will certainly outshine a lot of 4-wheelers on the market now. •

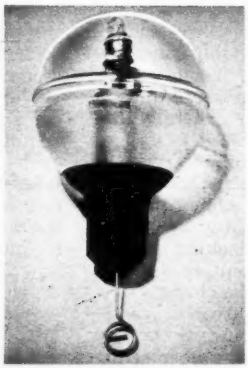


new

FOR THE SPORTSMAN

Guaranteed not to warp are these glass-plastic fishing rods. One specimen, in test machine, withstood the equivalent of 400 years of normal use. Made by Cal-Royal.

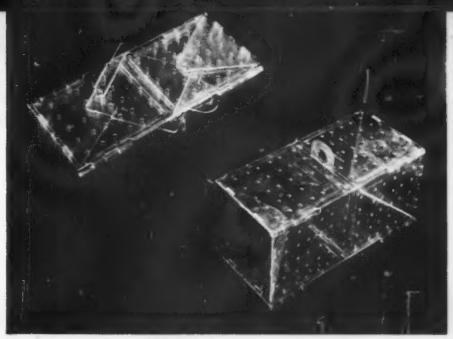


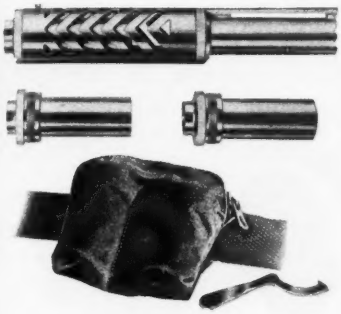


Float Light for night fishing flashes when a fish tugs at your line. It operates on a pen-cell battery and bulb which are easily replaceable. Shell is plastic. Use it as a convenient light source when baiting your hook in the darkness, too.

Fish Fyter is just the thing for the lazy fisherman. It takes the place of the regular dobber. When the fish pulls it below the surface, motion through the water causes the wings to extend. These push against the water, setting the hook and resisting the pull of the fish.

Plastic Trap for minnows is the latest gadget for the live-bait fisherman. No more bothersome wire and glass contraptions that take up more space than your tackle box! This one folds flat with a twist of the wrist and parks out of the way.

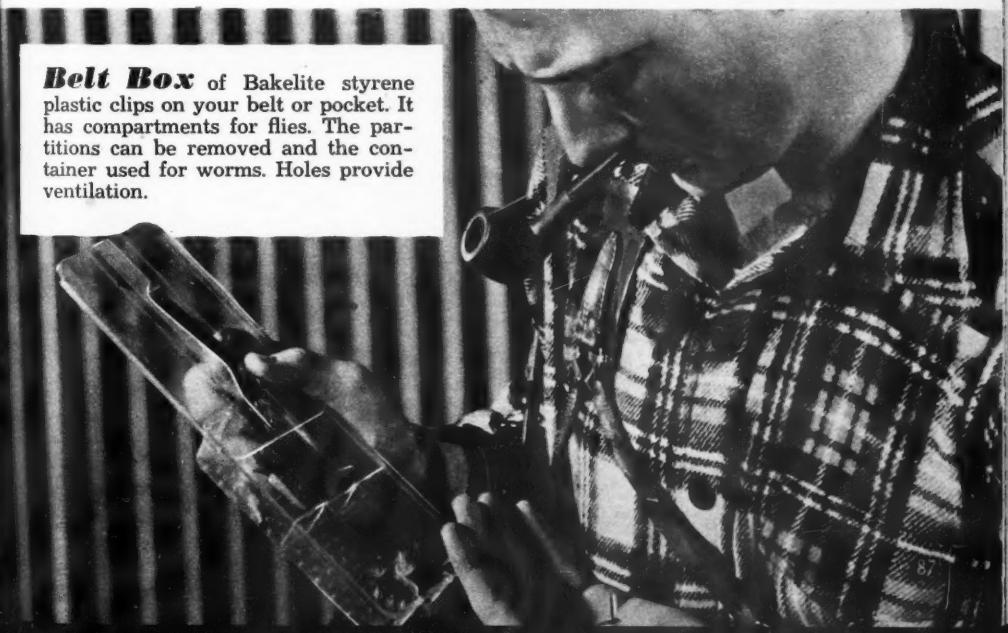




Anti-Recoil Tube for shotguns operates differently than existing types. Choke tubes extend within the cage instead of from the end. Shot enters pattern tube 7/8" from the gun muzzle. Gasses are caught between cage and tube, pushing the gun forward against the backward recoil.

Lightweight Reel of the spinning type weighs less than 6 oz. and is inexpensive. Spool holds 200 yds. of 8-lb. test spinning line and is quickly removed when another line is desired. The spool brake is sure-fire and won't slip. Reel has five Oilite bearings and its handle reverses for storage.

Belt Box of Bakelite styrene plastic clips on your belt or pocket. It has compartments for flies. The partitions can be removed and the container used for worms. Holes provide ventilation.



new IN SCIENCE

Sports Camera allows you to see that close decision at first base yourself. It has a high speed focal plane shutter and a Zeiss telephoto lens. The umpires aren't too happy because it makes second guessing an exact science.

Phon-A-Gram takes your telegraph message after regular Western Union offices close. You talk into a mike on a phone line to a central operator who counts words and tells you the cost. The machine takes your coins and even gives you change. About the only thing it won't do is hit the jackpot.

Metal-Plastic raincoat is lightweight yet durable. It's made from a metalized Vinylite with electronically sealed seams. This inexpensive coat won't crack or stick together. It folds compactly into an envelope of matching material which can be carried on those rainy-sunny days.

"and Molly"

Fibber McGee

Workshop Wizard of Wistful Vista

hobby HALL OF FAME

Fibber fashions a lamp stand from juniper log a radio fan sent him.

'TAIN'T funny, McGee. Fixing a fancy place up in the mountains so you can make like a wizard with your new workshop. What'll the neighbors in Wistful Vista think?

Millions of "neighbors" who eavesdrop on the family life of "Fibber McGee and Molly" over NBC get the chuckles when Fibber tries a little repair job and starts gimmicking with every tool in the place. It's downright serious, though, when the real-life Fibber, Jim Jordan, tools up his self-built workshop (below) for another table for his new home at Encino, Calif.

Marian, the radio show's Molly, suspects Jim was more interested in a snug hideaway for a bigger gadget shop than in a "Wistful Vista" of the mountains when he sold his old house and gave up all his shop-made furniture. Like Fibber, Jim loves any excuse to roll out a benchful of tools. For a few signs that needed only a band saw and some sandpaper, Jim used his band saw, bench saw, drill press, six-inch jointer and a special spray booth he's built behind his shop for painting his creations. But whether it's a "Keep-Off" sign or a carved cabinet, it's furniture fit for the Hobby Hall of Fame—no matter how many tools it takes. •

Photos by Louis Hochman

A MONEY-MAKING

idea

This little piggie plopped into the plate, and the Robertsons sat up nights trying to find the magic formula to keep her there.

A Pig Brought Home My Bacon

A Virginian's snapshot of a porker fell into his ham and eggs . . . and put him into the photo-novelty business in a big way.

BY DAVID T. ROBERTSON

President, National Photo Service and Supply Co.

I was polishing off my plate of ham and eggs last fall as the Virginia sun was soaking up the morning haze. My brother Shearer was laughing at a snapshot of my pet pig and razzing me about the beautiful friendship that had sprung up between the pig and me.

I gave him a sour look and kept on eating. He leaned back and let go another big ha-ha! The picture slipped off his fingers and fluttered face up on to my plate. My pal the pig lay there on the ham and eggs and wistfully looked up at me with her big wiggly snout and her sad little eyes.

My brother stopped laughing. I stopped eating. We looked at the cute pig on the plate, then at each other.

"Think we can do it?" he asked.

"I don't know. . . . But if we can it'll be the biggest photo novelty in years."

The idea smacked both of us at the same time: Put your favorite photo permanently on the dinner plate.

"Let's go to the lab and get to work," I said as I pushed away from the table.

That was the start of a chain of lab experiments and how-to-do talks that kept stretching on and on, night and day. The hills around Appomattox turned from autumn gold to winter white, but still we got nowhere with our problem of developing a photo-emulsion that would make a good picture stick permanently to hard surfaces like chinaware, tile, glass or plastics.

We had already built up a fair photo business by printing and developing pictures for our friends and neighbors. Shearer and I had started out with only $2.98 in cash and set up our lab in an old chickenhouse at our place. Though some of our best "business associates"

were pigs, we managed to expand month after month and soon were doing all right. Still, that idea to put pictures on china kept haunting us.

Early one morning near the end of the year we mixed up still another batch of chemicals in our endless quest for the secret formula. We spread it on an old dinner plate and tried projecting a negative on the stuff. When we developed the plate, the smooth black-and-white halftones of the original picture formed on the china. Nervously I grabbed another plate, and we started more tests. Again good—all good! The Curies discovered radium, Einstein had his relativity—but they had nothing on us. *The Robertsons had found their formula!*

Now, I have to keep details of our formula in the darkroom a while longer, to protect us until our patent comes through from Washington. Then, about the first of the year, we're going to package the emulsion and distribute it throughout the country.

One little trouble we did find with our secret emulsion came up when we first sprayed it on the plate. The stuff fumes a bit. It's not poisonous but it's annoying. We are working on this angle now and hope to rid our coating mixture of the fuming nuisance before long. In the meantime, we keep a gas mask handy to slip on as a convenient protection during the spraying phase.

We found the coated plates dried better in an air-conditioned room. After an hour, the plates are ready for the picture. With an ordinary photo-enlarger we project the negative on the coated plate, then develop it in a regular photo solution. After washing the plate a few seconds in an acid shortstop, we dunk it in a hypo-fixing bath. When we have washed the plate thoroughly in running water, we put the plate under infrared lights to dry. Then we glaze and bake the plate for an hour, and that fine face looking up at you from the dinner plate is all set to last as long as the dish itself.

We've been swamped with dishes, glassware, bookends and all sorts of hard-surfaced bric-a-brac ever since our neighbors got the word we could conjure up faces on their dining-room plates. We've got 15 people working for us now. At the rate we're moving ahead, though, we expect to have 500 workers putting out the stuff for us in a mass assembly line by 1953.

If you're a photo fan, you can set yourself up in the picture-plate business, too. Like us, you can build a fine business with just a few bucks as cash and any old room or shed as a workshop. Judging from our setup, your worry will be to keep the customers from stampeding the place.

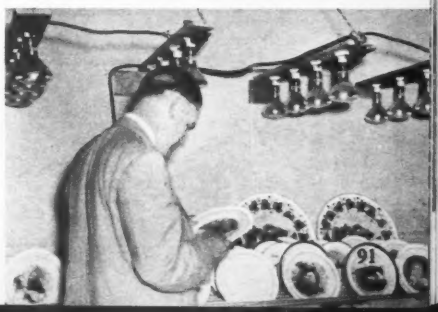
My pet pig has gone to market but I'm so grateful to that cute pork-in-the-plate I've practically sworn off ham 'n' eggs. For before that pretty little pig went to market she brought home my bacon—all wrapped up in a beautiful money-making idea. •

Shearer Robertson uses a gas mask to guard against fumes as he sprays on the emulsion.

Coated with secret emulsion, the plate's now ready for photo projected by enlarger.

Lab worker squirts fixative on the plate picture before glazing and baking the dish.

David Robertson inspects a finished plate as the dishes dry under infrared lights.



Our New Giant Flattop Will Launch Atom Bombers

BY JERRY GREENE

An exclusive story on the Navy's 65,000-ton secret weapon for hit-and-run A-bomb attacks.

YOU can see her now, as she will look about 1952, the great seagoing air base, boiling along easily through storm-pitched waves at 55 knots and jet-launching her task force of atom bombers.

She's the Navy's newest and biggest flattop, an admitted 65,000 tons of fighting ship whose deck is the equivalent of 10,000 feet of hard and dependable runway. Zooming up from her bow in a jet-assisted takeoff is one of her 40 A-bombers, a trifle smaller than the B-29 Superfort but twice as speedy.

Secretary of Defense Forrestal and the nation's top military leaders approved plans for the mammoth 1500-foot carrier at a secret Florida meeting of the Joint Chiefs of Staff. In case of sudden war, the Joint Chiefs of Staff are directed to use her bombers in swift, shattering attacks wherever they can strike within their 2000-mile radius.

Estimates now indicate the finished flattop will carry a $150,000,000 price tag. The Coral Sea, the Midway and the Franklin D. Roosevelt—the big 980-foot, 45,000-ton jobs that are our latest carriers and that now form the backbone of our postwar fleet—cost about $90,000,000 each.

The new queen of our flattops will have a flush deck with no tower or superstructure on the side—a throwback to the old

This closeup of the giant carrier's flight deck before a dawn takeoff shows how MI's artist visions the ship-based A-bomber. Already hooked on the catapult, the bomber is about to get its atom load. Two propeller-jet engines in each wing power the 3-man plane at near-sonic speeds.

Langley in 1922, the first ship we converted for carrier use. All our current carriers pack the communications quarters, the captain's bridge, the radar equipment and multiple gunmounts into the "island," the towered structure you see on the side of the flight deck.

By eliminating the island and by using smokestacks that can fold away to the side, the new carrier will give its big planes a broad, unobstructed runway for takeoffs and landings. The Ranger, our first ship built from scratch as a carrier, used this folding-stack idea but still had an island. On the new carrier, a

Jets can already do the job on carriers. Phantom shows as it plops on Saipan's deck.

control bridge just below the forward edge of the flight deck will take the place of the island. New radar and television devices and scanning periscopes will show the skipper what's going on all over the ship as if he were still perched high above the flight deck in a commanding island.

In addition to at least four catapults slotted in the deck and capable of slinging even the big atom bombers aloft at 10-second intervals, the new ship also will have launching platforms for our modernized version of the Germans' mighty V-2 rockets. The Navy already has successfully fired the V-2 from the reinforced deck of the Midway.

A prime factor in developing the new carrier is the power plant, which must have terrific energy to drive the giant ship through the sea at 55 knots, or some 60 miles per hour. If work on atomic energy has advanced sufficiently by the time the ship is ready for its power plant, an atomic motor may replace the great turbines now planned. The ship will be more than big enough to carry all the lead needed to shield the crew against an atomic engine's deadly radiation.

Despite its colossal size, the flattop queen will be no sitting duck for enemy planes or subs. She'll be far better protected against bombs and torpedoes than our sturdy Midway class of carrier is today. Heavy armor plate will bolster the flight deck's hard-board surface, and the latest wrinkles in blastproof compartments will be incorporated in her bulging double hull. Now the Midway has a lot of guns. Eighteen 5-inch dual-purpose guns in steel tubs guard her against attacks by sea or air—with plenty of closeup support from 21 quadruple mounts of 40-millimeter and 28-millimeter machine guns bristling around her decks. But the new queen will have nearly double this armament—and guided missiles!

Even without such powerful antiaircraft defenses as the queen will pack, an enemy would find it extremely "unprofitable" to toss away precious A-bombs in a futile attempt to bull's-eye the flattop.

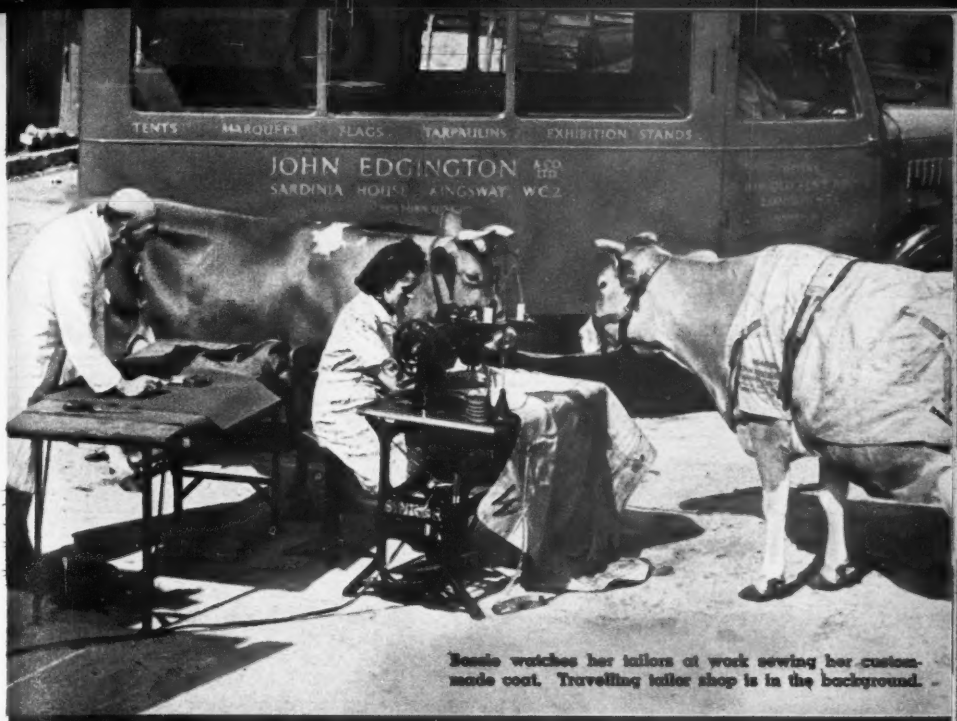
Catapult slinging this jet fighter off the bow of the Carrier Saipan gives us a preview of the way the big flattop will launch its atom bomber.

Naturally, while working on plans for the new queen, the Navy's also busy blueprinting the atom bomber to fly off her deck. Carrier catapults and the tricky arresting gear that snubs the planes to a short, fast halt when they land will have to be strengthened for the big bombers, but the principle's the same. The bombers will need folding wings for easy handling aboard ship and for storage on the hangar decks—a problem that merely calls for an adaptation of the folding wings now in use on the twin-engined McDonnell Phantoms in the Navy's first all-jet fighter unit. Since a carrier plane literally drops 10 to 30 feet onto the deck as it dives down into a landing, the 100,000-pound carrier-based atom bombers will have far stronger and heavier landing gear.

There'll be no trouble getting the giant planes off the flight deck. In addition to the powerful sling catapults that the Navy has built into its carriers, JATO—jet-assisted takeoff—has now been so perfected that the Coral Sea recently was able to jet-launch from its deck the two-engined P2V Neptune, the longest-range plane in the world. Even without such takeoff aids, the new carrier's own speed, the breeze over the deck as it heads into the wind, and the 50-foot height of the deck above the water give the carrier's deck all the advantages of a 10,000-foot runway on land.

It will be four years before the Navy can add the first of a mighty line of new carrier-dreadnaughts to its modernized fleet. By that time some other country may be turning out A-bombs in quantity. Any potential aggressor, though, will think twice before making a move that will send the new ocean airdromes slashing through the seas to hurl their atomic task forces at the enemy—and atomize all his key targets. •

Phantom jet, forerunner of the super carrier's air arm, starts free-run takeoff on Saipan.



Bossie watches her tailors at work sewing her custom-made coat. Travelling tailor shop is in the background.

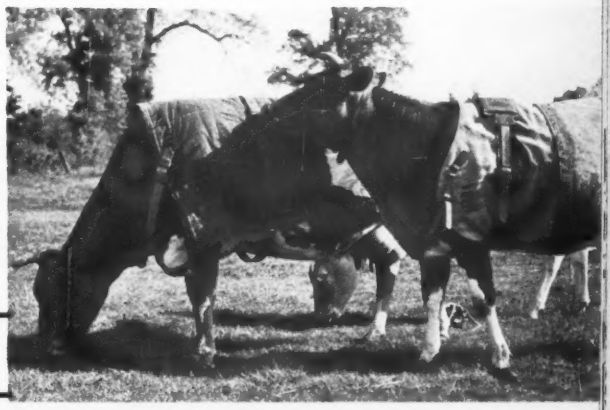
Cow Coats = More Milk

ALL women go for pretty clothes! But up until recently there's been one gal we've been neglecting as far as the "new look" is concerned—and she's Bossie, the cow.

She, too, has a soul and an eye for feminine dainties, says Mrs. Barbara Woodhouse, of Stoke Mandeville, Bucks, England. To prove it she has taken her 13 Guernseys and dressed them up in tailor-made coats—heavyweight for cold days, waterproof for wet days and lightweight cotton for balmy, summer weather.

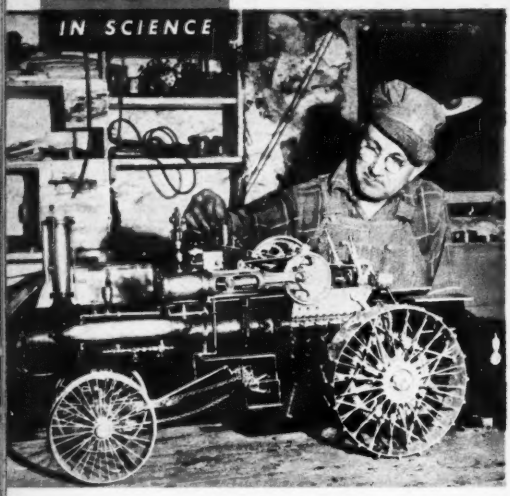
The result? Her cows are more contented, don't require as much food, and give more milk. Although the national average milk yield per cow is 550 gallons per year, Mrs. Woodhouse's "ladies" produce from 1,000 to 1,400 gallons each, almost 4 per day. The secret, she says, is that cows like to be kept warm.

John Edgington, the cow's tailor, is sure there's a future in his new business. •



Here's what the well-dressed cow will wear this year—if Edgington has his way.

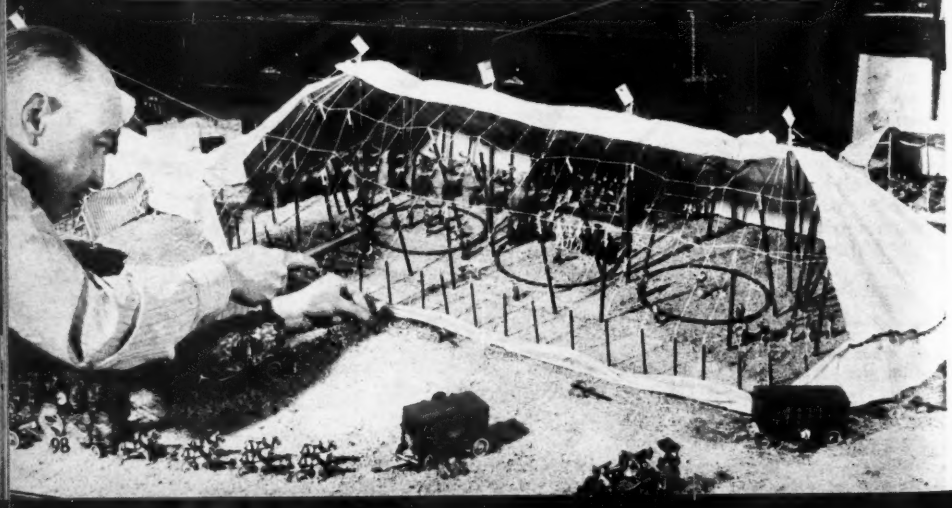
new IN SCIENCE



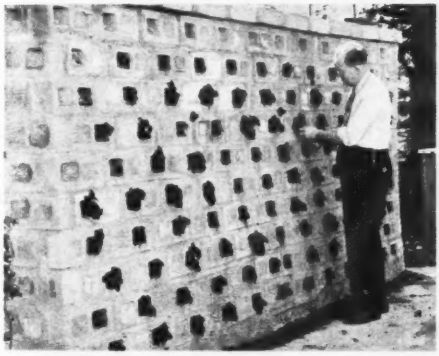
Steam Tractor digs a mean furrow using charcoal or compressed air as fuel. It's a model of an old type farm machine built on a scale of 2 inches to the foot. Machinist Warren A. Taylor of Kansas City spent 2 years and $200 working on it in his home workshop.

"Gizmo" is a model fighter plane that looks like a strange sea fish. But like no fish alive, it flies through the air for 3 minutes. Roy Hurtig, an electrician's mate on the USS Vulcan has made scores of such gasoline-powered airplanes during his off-duty hours at sea.

Hurry, Hurry, Hurry! This littlest Big Top contains all the astounding thrills of the circus in miniature. Ray Friesel of Pittsburgh dreamed about joining the circus but couldn't. So he built a 3-ringer of his own with 6 tents, 30 clowns, 80 musicians and a full complement of animals, acrobats and trainers. It covers 55 square feet and is worth about $2,500. Friesel is probably right when he calls it "The Greatest Little Show on Earth."



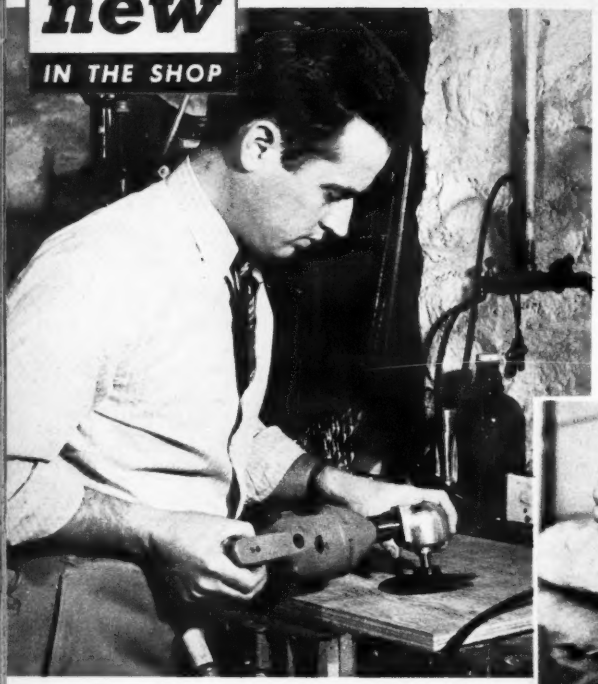
Package Pump saves you lots of wind. The multi-purpose air mattress is packed in a container which also serves to inflate it with a few strokes. Holes in the tufts allow the plastic mattress to "breathe" when it's slept on and drain when used for surf-riding.



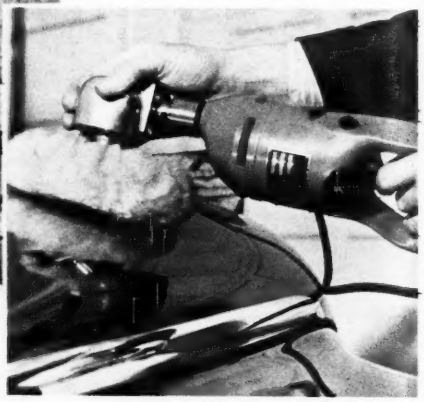
Concrete Garden. arranged in hollow, cement blocks piled vertically, raises strawberries for Henry Hayward of San Fernando, Cal. The berry patch contains 350 plants.

Wet Foot of model Juliet Hamrin proves that's real water soaking those General Electric loudspeakers. Moreover, it is reported that when removed from the bath, both foot and speakers continued to function normally.

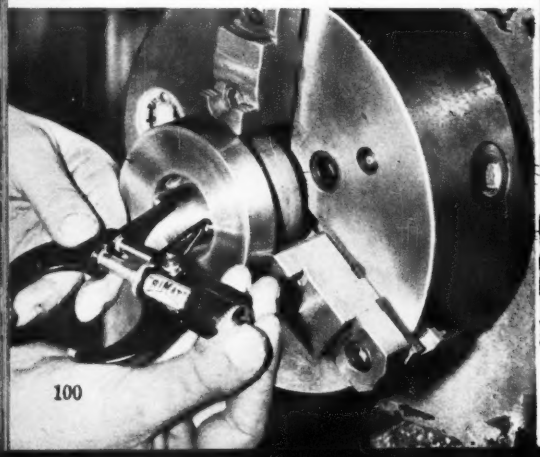
new
IN THE SHOP



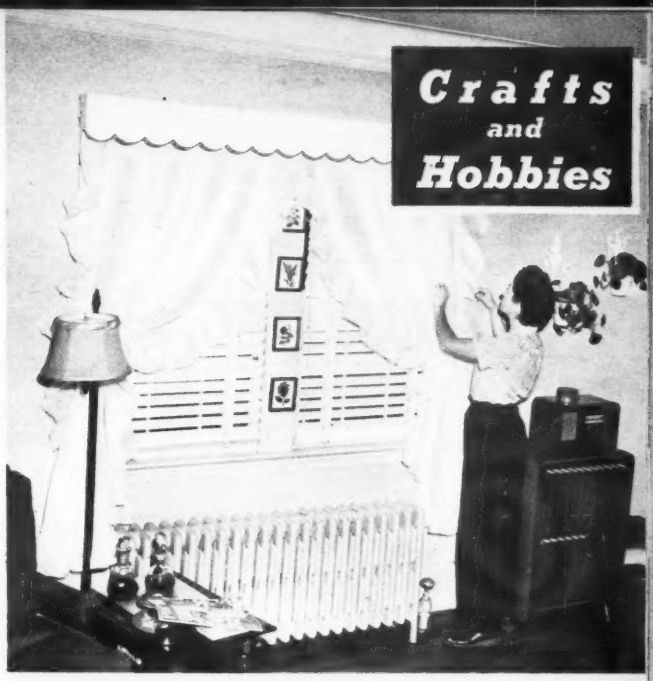
Bull Buffer that fits the chuck of any standard electric drill saves many weary hours for home mechanic. Either sanding disc or polishing wheel can be used. Right-angle gear box, with large reduction ratio, gives added power and prevents stalling of motor. Whole unit is mounted or dismounted in a few seconds. Made by D. N. Bertram Engineering Co., Kansas City.



Duplex Micrometer, by Richards Machine Tool Company, takes both inside and outside measurements. It is a great convenience for all machinists, especially lathe operators. Photo below, right, shows measurement being taken on outside diameter of shaft. Photo directly below shows micrometer being used to check inside diameter of bushing chucked in lathe. Adjustments are independent of each other.



make your own Window Cornices



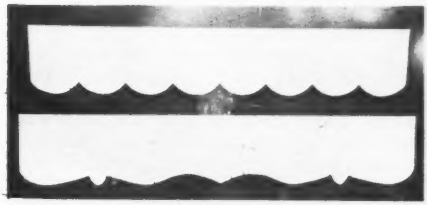
Above: Decorative but unobtrusive, this long cornice makes a neat "cap" for a pair of fluffy curtains.

AFTER having all the Venetian blinds in our house refinished, retaped and recorded, my wife decided she wanted cornices on all the windows. She called a local decorator's shop and was given an estimate of $4 per foot for the job. I didn't need a slide rule to figure out that for 14 windows, running a total width of about fifty feet, the bill would come to the staggering total of $200.

"That's too much," I complained. "We just spent a fortune on the blinds."

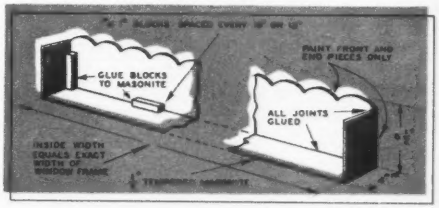
"For once I agree with you," she said. "But I still want cornices. The samples I saw at the decorator's looked pretty simple to me. Even *you* could make them. So you're elected."

I was not only elected, but I won, much to my surprise. The finished cornices, as pictured herewith, turned out to be beautiful (that's what the wife says), and what's more, they cost less than $12. How much time? Two week ends.



Above: Two suggestions for cornice patterns. Recommendation: Avoid the complicated designs.

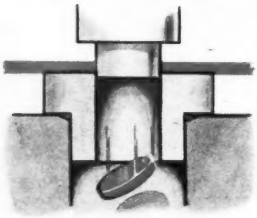
I started the first cornice with ⅜ inch wood, but it weighed a ton and I discarded this material in favor of ⅛ inch tempered Masonite. This proved to be ideal for the purpose. Properly reinforced by a few right-angle wood blocks, the assembled cornice is strong, rigid and easily put up with one hand. The double one shown in the top illustration is seven feet long and hangs perfectly straight.

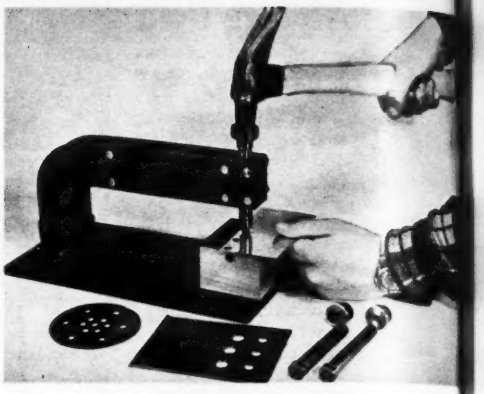


Above and below: Inside wood blocks, glued into place, make assembled cornices strong and rigid.

The basic construction is simplicity itself. The cornice is an open box consisting of long top and front pieces tailored to fit the window, with small end pieces. The proportions are determined by the tastes of the lady of the house. The cornices shown in the pictures are 6½ inches in their vertical dimension and the side pieces are four inches deep. This gives plenty of room for curtain rods underneath. The main requirement is to measure the window frame carefully and to [*Continued on page* 150]

SHEET METAL PUNCH





In operation, a moderate blow with a hammer will put the punch cleanly through the sheet of metal.

Accurate holes in steel, copper, and tin are easy with this tool.

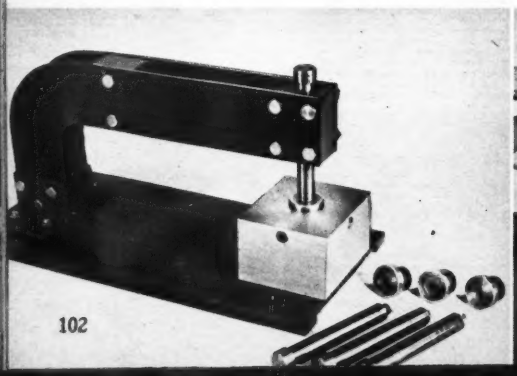
BY JACK MELLINGER

EVERY craftsman has a pet sheet-metal project that he has been putting off because it required laboriously drilling and filing many holes, elongated slip-bolt slots, or odd-shaped nibbled openings. If you are in this boat, make the simple punch shown here—no trick to make and fast and accurate to use, it will pay for itself the first time you use it. It'll punch through all thicknesses of metal up to 16 ga. and, with its large throat, will punch to the center of an 18-in. circle. Except for the punches and dies, which are lathe projects, it is made entirely with hand tools.

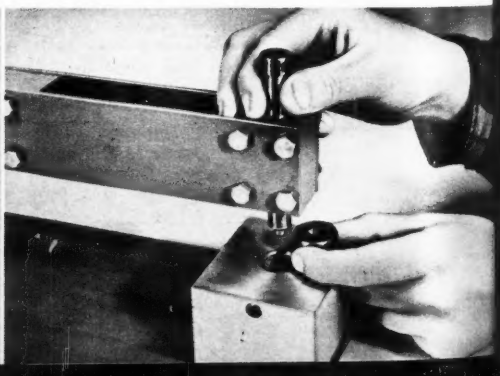
In order to insure perfect holes, a sheet-metal punch must be strongly built and perfectly aligned. This means that a rigid truss, or arm, and a solid anvil are necessities. The truss plates are hacksawed from ⅛-in. stock and filed to shape. The base, which must be as flat as possible, is cut from ¼-in. plate. The spacers, anvil, and angle-iron brackets are also hacksawed and dressed down to size with a file. To insure perfect alignment, each bolt or screw hole should be drilled through all the pieces concerned at once, clamping them together for the purpose. The holes in the base are countersunk on the bottom. The anvil has a setscrew in its side to hold the die in place. The vertical holes in front spacer and anvil must line up perfectly.

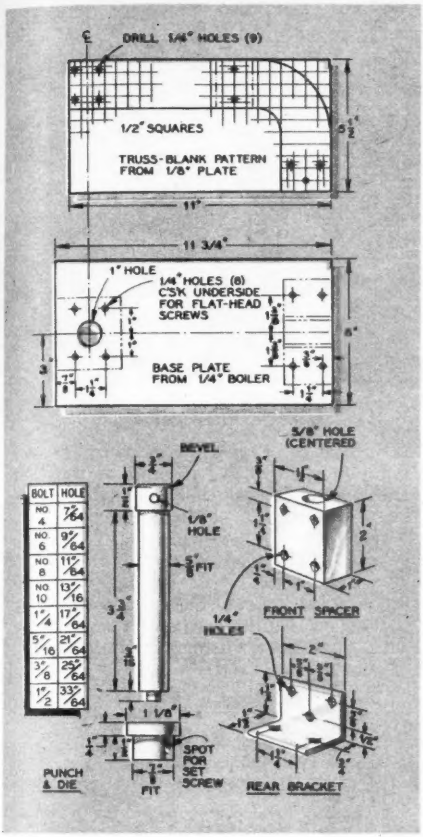
The punches and dies are turned out of tool steel, this type being fairly easy to work and to harden. The shanks of the punches are turned about .003 in. smaller than the front-spacer hole so they will

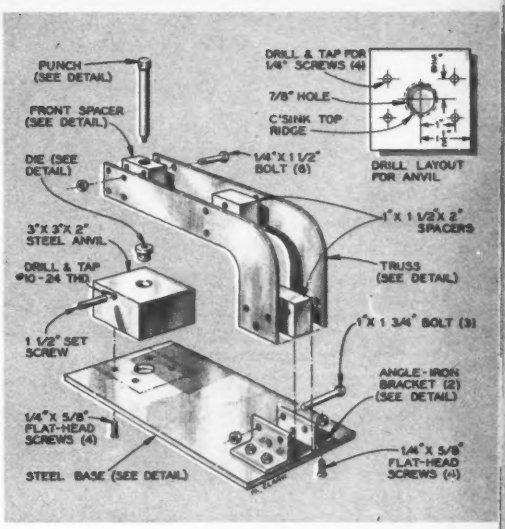
Here's the tool, complete with extra punches and dies. The deep throat permits punches to center of an 18-in. circle without taxing the capacity.



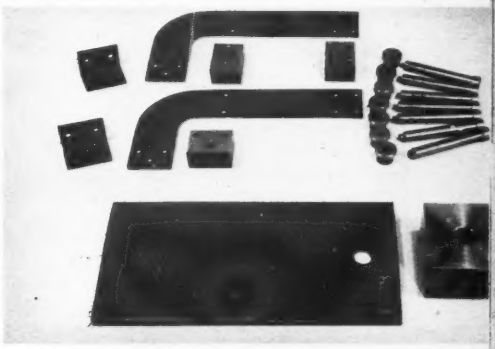
Inserting or removing a punch-and-die set is easy; so quick hole-size changes for complex projects are not only possible but a pleasure to undertake.



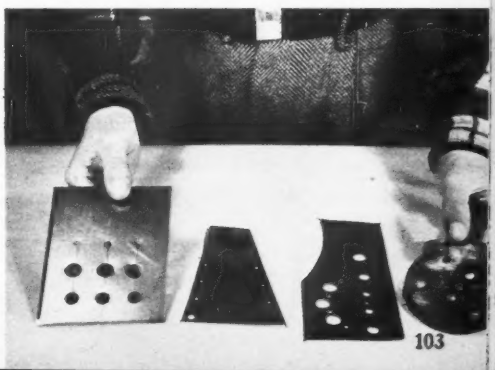




All the parts for our sheet-metal punch appear below. Note the simplicity of the construction and the variety of punches and dies that will fit.



Nearly all species of metal and thicknesses up to 16 ga. can be punched or nibbled cleanly and with dispatch, providing the tool is perfectly aligned.



pass readily. The lower parts of the dies are likewise turned a shade smaller than the hole in the anvil to allow simple insertion and removal. The tips of the punches should just fit the die holes—again with about .003-in. clearance. This gives a clean, sharp hole in the material punched.

To harden these pieces, the dies and the tips of the punches are heated to a cherry-red color; then allowed to cool in the air. The result is so hard that it can't be worked, even with a file, thus assuring long life for our sheet-metal punch.

Make up your dies and punches in accordance with the accompanying chart, which lists hole sizes that just pass standard bolts and screws. In operation, the centerlines of the hole to be punched are marked on the metal and the punch tip is lined up by eye; then one blow with a hammer will put the punch through the metal. If the punch binds, twist it, using a nail in the hole at the top for leverage. •

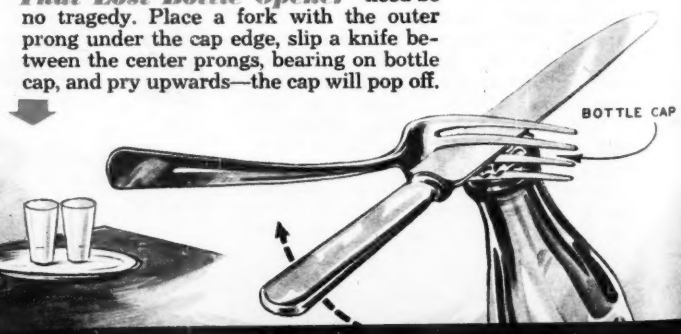
Home Hints

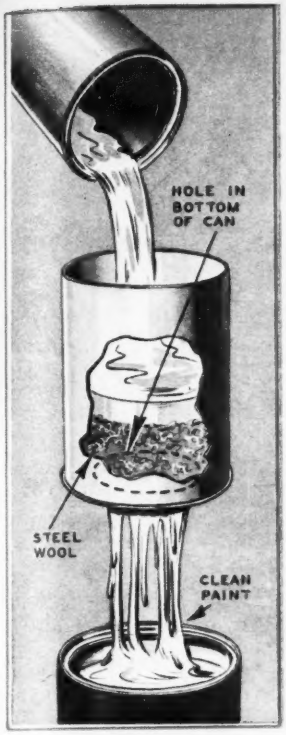
A Foolproof Clothesline that can't tangle is made by installing two pulleys at one end of the line and one pulley at the other end. This keeps lines well separated.

Keep Typewriter Level to cure tendency of carriage to slip. Place a spirit level across the front, as shown, and build up feet of typewriter with cardboard washers until level.

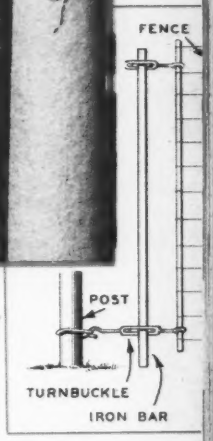
When You Want a small funnel and don't have one around, all you need is a beer can of the type pictured. Remove top, drink or otherwise dispose of beer, cut bottom out with a can opener—and there's your funnel.

That Lost Bottle Opener need be no tragedy. Place a fork with the outer prong under the cap edge, slip a knife between the center prongs, bearing on bottle cap, and pry upwards—the cap will pop off.

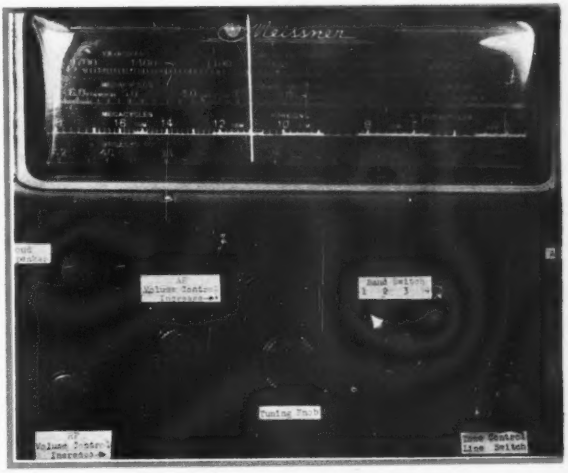




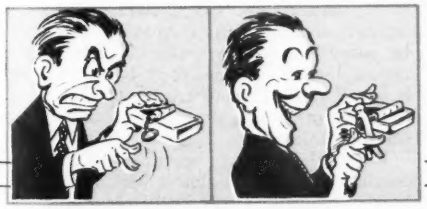
A Paint Strainer can be improvised from an empty tin can and some coarse steel wool. Cut a good-sized hole in the bottom of the can and put about an inch of steel wool over the hole. The steel strands will catch every particle of foreign matter in the paint. Renew the steel wool after each straining job.



No Sagging Fences if you install easily tightened turnbuckles at the corner posts, as Claude Higgins, of Tucson, Arizona, did. The "floating" upright shown is a length of 1-in. galv. pipe. A strap-iron stay running through the two turnbuckles keeps them from loosening.



Temporary Name Plates for the controls of homemade receivers and transmitters can be made by typing the required nomenclature on white paper and attaching the slips to panel with cellulose tape, which will prevent smudging.



Opening Stubborn Cans. If the opener on a can of sardines seems to be rolling more skin off your fingers than metal off the can, try slipping a clothespin over the handle before turning. You'll get leverage with no damaged hands.

MI's Portable Six-Inch Telescope

Our powerful instrument nears completion as we undertake the delicate task of polishing and parabolizing the mirror.

BY ROBERT BRIGHTMAN

LAST month we finished fine-grinding the mirror. We are now ready for polishing. But, before going any further, carefully clean your work area. Remove every single trace of carborundum as if it were a germ. One single grain will be enough to put several ugly scratches on your pride and joy. It won't ruin your mirror but it won't make you feel too good, either. If you have the room, it is best to do the polishing in another part of the house which has not been contaminated by carborundum. If possible, secure another barrel as well.

Now that these warnings have been established, we can proceed. Take the pitch, which is part of your mirror kit, and break it into chunks and place them in a tin can or an open saucepan for heating. You won't be able to use the saucepan again so it better be an old one. It is best to do the heating over an electric hotplate rather than an open gas flame as pitch is quite inflammable.

While the pitch is warming up (do not permit it to boil or else it will become too hard when cool), carefully clean the tool under a running tap of warm water. Allow it to dry by standing on end and then replace it on the barrel. The next step is to cut a collar of light cardboard to act as a dam. It should extend about ¼ in. above the top of the tool. The paper collar should be long enough so it will overlap about 2 in.

when wrapped around the circumference of the tool. It can be kept in place with a piece of tape. Moisten a rag with turpentine and swab the top of the tool.

By this time the pitch should be all melted. Strain it through four thicknesses of cheesecloth and start pouring it over the tool. Start at the outside and keep working toward the center. Don't worry about the pitch leaking through the collar—it won't. When the pitch has formed a pool level with the top of the collar, quit pouring.

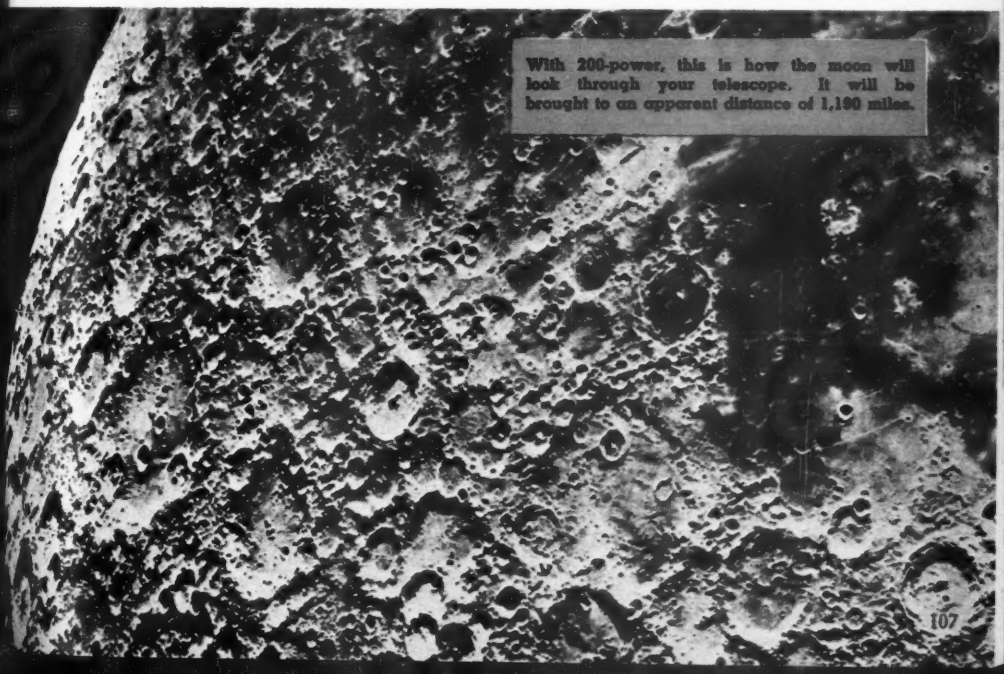
Wait until pitch has hardened a bit and then strip away the cardboard. The next step is to sluice the surface of the mirror with a sudsy solution of soap and water. Now carefully lower the mirror over the pitch lap and keep moving it around in various directions an inch at a time. These movements will serve to conform the pitch lap to the spherical curve of the mirror.

Keep this up for about 45 minutes or at least until the pitch no longer feels warm. The pitch will start to spread out and form a ridge around the outside of the tool. Don't let this worry you. After making sure that the pitch lap and mirror are well separated by the soap solution, you can go about some other business. Leave the mirror and tool this way over night (plus a guard of some kind to prevent a tragedy).

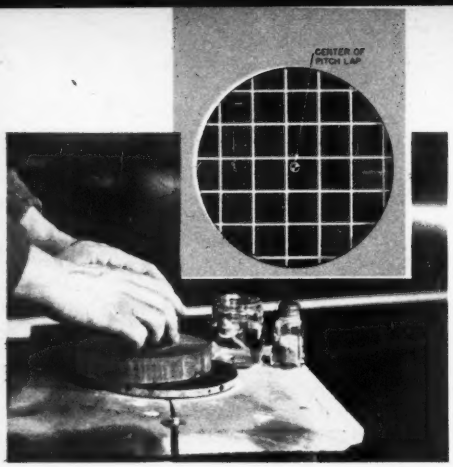
The next day when you try to remove the mirror from the tool your heart will skip a beat, for you will practically find it impossible to budge the mirror. Why? The weight of the mirror has caused the outer edge to sink into the pitch lap. Trim away the excess pitch with a moistened knife. This should free the edge of the mirror and with a little pressure in various directions, you should be able to move the mirror. Carefully slide it off and put it aside. *Cover it to avoid dust.*

The next step is to cut facets in the pitch lap. This can be done with a hack saw. Moisten the hack saw blade and just slice away. Don't fret if the pitch splinters a bit. It undoubtedly will and may make the line look ragged and uneven. This will not affect the polishing operation. There is just one important warning to heed when cutting the facets and that is this: Don't cut the pitch lap so that one of the facets is exactly at the center. It should be offset about ¼ in. as shown in the drawing. This is necessary to prevent the mirror from polishing in rings. After you have finished cutting the pitch, you will be rather disappointed in the sorry looking mess that your lap now exhibits. It will come to reason. Again moisten the mirror with the sudsy soap solution and place it down over the pitch lap. Let it stay this way over night. This should make the pitch tool reconform to the curve of the mirror.

And now for the actual polishing. Get a quart milk bottle and fill it about ⅓ full of warm water. Dump the entire package of rouge which came with your kit into the bottle. Put your hand over the open end

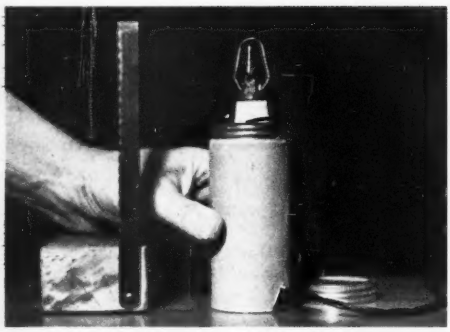


With 200-power, this is how the moon will look through your telescope. It will be brought to an apparent distance of 1,190 miles.

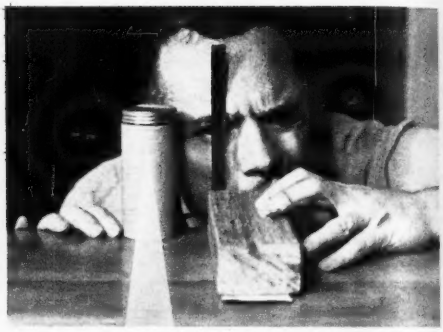


The polishing stroke is the same as the grinding stroke. Note in the inset that center of the pitch lap is in the upper left hand corner of a facet.

Close-up of pitch lap. It is made by pouring melted pitch over grinding tool. Facets are scored with a hack saw. Irregularities have no effect on polishing.



Apparatus for making the knife-edge test consists of hack saw blade mounted on block of wood and a lamp placed inside a tin can for a point source of light.



Knife-edge test is made at a point about 108 in. from mirror. It is very important to have a solid support for the mirror as well as for the testing apparatus.

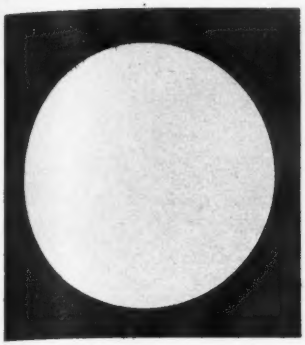
and shake the contents up and down thoroughly. Wear old clothes as you will become a gory red due to staining action of the rouge.

Procure a half-pound jar with a screw lid. Bore a hole in top of the lid and through it force the rubber tip of a medicine dropper. Over the open jar, place a triple thickness of cheesecloth. Shake the bottle containing the rouge solution thoroughly and pour about half of it into the jar using the cheesecloth as a filter. Discard the cheesecloth with any remaining particles of rouge. Stir the rouge solution a bit and use the jar lid and medicine dropper as an applicator. Squirt a dropperfull of the rouge solution over the mirror and start polishing.

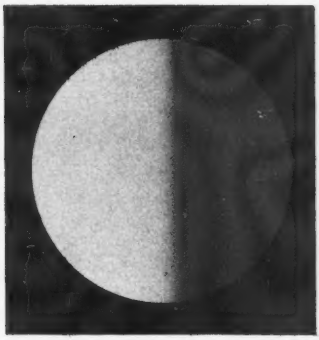
Use the same stroke that you employed in grinding. Time yourself. You may have to add some more rouge after 5 or 10 minutes, especially if the mirror starts to stick. Sticking can sometimes be eliminated by carefully sliding the mirror off the lap and then bringing it down again. If the mirror persists in sticking despite your best efforts, this can be usually eliminated by a reapplication of the sudsy soap solution to the surface of the tool. Add some rouge and start in to polish. The soap acts as a lubricant and permits the mirror to slide over the tool until both surfaces are again in perfect contact.

Keep up the polishing for about a half-hour. By this time you must be wondering, "Is this really working?" Wash the rouge off the mirror, stand it on end to dry, sit down, take a smoke and cool off. When you have finished your cigarette, take a look at the mirror and your heart will regain its lost beat when you see a gleaming, polish starting to cover the surface of your speculum. You will notice that polishing, however, is more apparent in the center rather than along the edges. The edge of the mirror is the last surface to be polished.

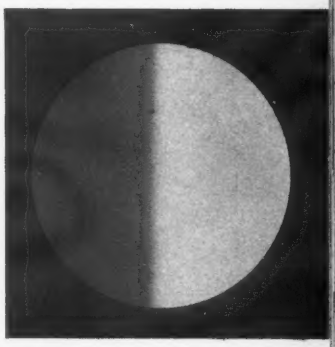
A polishing "spell" should consist of at least

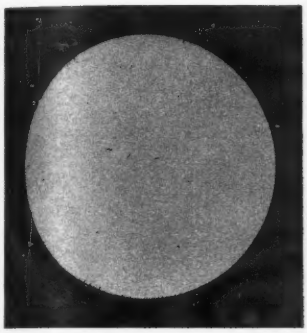


This is how the mirror will look when the pin point of light enters your eye. It will be dazzling with light. Zonal imperfections will show up as shadows.

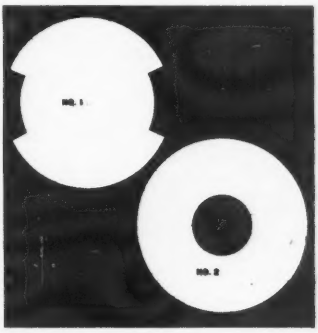


When knife-edge is brought in at a point before the focal point, the shadow will move toward the left. Beyond the focal point, it will move toward the right.

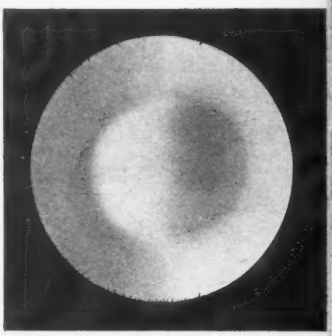




A spherical mirror will darken evenly all over with the knife-edge at the exact focal point.



Cut two 6 in. cardboard masks to measure the central zone and the outer zone of the mirror.



This is the type of shadow your mirror will exhibit if it is properly parabolized.

a half-hour's work. It usually takes 3 or 4 minutes for the surfaces to make good contact and for this reason there is no point in stopping after, say, 10 minutes' work.

If we want, we could continue polishing without worrying about the figure of the mirror until the final pit has disappeared from the edge of the speculum. However, as we humans are a curious lot, we would like to know exactly how polishing is coming along. To do this, we need a hack saw blade and a pin-point source of light. With this simple apparatus we will be able to conduct the most delicate and exacting test known to optical science. It is known as the Foucalt knife-edge or shadow test.

The pin-point source of light, as can be seen from the photograph, consists of a 7-watt candelabra base lamp mounted on a block of wood. Over this is placed a cardboard tube or can with a ½ in. hole punched opposite the filament. On the inner side of the hole paste a bit of wax paper to diffuse the light. On the outside of the hole place a piece of tinfoil and perforate the tinfoil with a fine needle. Take care not to pierce the wax paper. The hack saw blade can be mounted on a block of wood.

Place the polished mirror on a firm support and then place the knife-edge and the lamp at the center of curvature which should be about 9 ft. or so (the radius of curvature is always equal to twice the focal length). Inasmuch as it will be quite hard to pick up the pin-point of light, it is best to take the sleeve off the lamp and explore the area with the naked lamp. Put your eye close to the lamp and move back and forth until you suddenly see the reflected image of the lamp. This is a real image which appears to be suspended in the air. If you take a piece of ground glass and place it before your eye, you will see the image of the lamp thrown on the ground glass just as though you [*Continued on page* 146]

Seagoin' Signposts

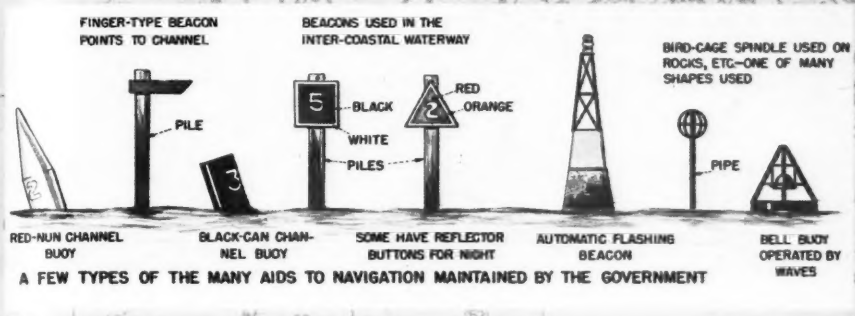
Photo by Rosenfeld

By Wm. F. Crosby

CHARTS for the use of mariners may be likened to autoist's roadmaps. They are, however, much more accurate than the usual roadmap—and rightly so, for a mariner's safety is directly proportional to the reliability of his chart while an autoist seldom suffers anything worse than annoying inconvenience if his roadmap is inaccurate. So, on a typical chart, each little indentation in the shoreline is shown; each shoal, rock, and reef is marked; buoys and lights are in their exact locations; prominent landmarks ashore, such as church steeples, factory smokestacks, and watertanks, are indicated; depths of water are given; and even the composition of the bottom is specified. With the aid of an up-to-date chart and a little common sense, any boatman can determine his exact location at any time that he is in sight of land, providing there is no fog.

Carrying our analogy further, the different types of buoys that the Government places on coastal waterways might be called seagoing signposts. They are used to mark channels, shoals, rocks, reefs, and other obstructions. By noting the color and the number of a buoy, one can identify it on his chart, thus pinpointing his location. Remember this, though—every year some buoys are changed; so play safe by always using the latest charts.

It's a good idea early in the season to buy the charts covering the waters that you will be in most. Spend a few evenings poring over these—you'll be entertained as well as instructed. Then, when



A FEW TYPES OF THE MANY AIDS TO NAVIGATION MAINTAINED BY THE GOVERNMENT

On our waterways, charts are the roadmaps and buoys, beacons, and so on are the signposts.

you go out in the boat, take them with you and check the various buoys, lights, and landmarks. In a short time you will become as proficient at it as if you had been born and raised on local waters and you'll be able to pilot your boat with absolute safety and confidence.

Local channel markers put out by fishermen usually are thin sticks or even small trees with the leaves still rattling in the breeze. As a rule, unless you have knowledge of the local waters, it is risky to chance passing through such a channel. Sometimes the sticks are not channel markers at all, but indicate fish traps, nets, or set lines. There's no way of telling; so it's best to keep clear.

Each lighthouse has its own distinctive paint job—some are white all over, others are striped in different colors, and still others are spirally painted like a barber's pole. This is done for day identification. At night, these lights flash their warnings in set patterns. With a Government publication called the *Light List,* you can identify each light by its characteristic flash. Some lights show green and some, white. Red, unless specifically stated otherwise in the *Light List,* denotes a danger area. You may approach a light at night and see it flashing white or green; then suddenly see it turn red. Look at the chart at once, because when you get into the red sector of a light, you are heading for trouble. Each lighthouse also has an audible signal that is distinctive, thus making identification possible in a fog.

Charts are available from retail stores and such Government offices as the Coast and Geodetic Survey, Washington. •

Controline BELLANCA FLASH

For scale flying and all-around stunting nothing will match this 46-inch replica of the famous "Irish Swoop." For .49-.65 gas or Diesel engines.

BY WALTER MUSCIANO

SELECTED by Holland and Ireland as their entries in the 1934 London-to-Melbourne race; west-to-east Atlantic Ocean record holder, the Bellanca Flash was truly a famous airplane of its day. Manufactured by one of the pioneer aircraft corporations in this country, Bellanca aircraft are still popular in Alaska, Mexico and South America where the famous Skyrocket and Air Bus—both Bellanca designs—are being used for light cargo and passenger work.

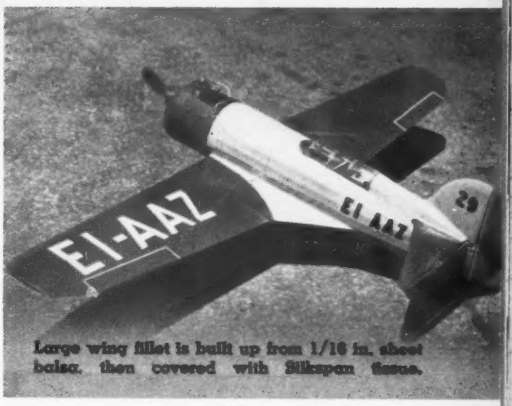
The Bellanca Flash, after which this model was patterned, was christened the "Irish Swoop" by Irish Hospitals Trust, Inc., as Ireland's entry in the London-to-Melbourne race in 1934. Piloted by Eric Bonar and Captain James Fitzmaurice, the plane got off to a good start but unfortunately was forced down with engine trouble while over Belgium. Two years later, Captain James Mollison established a trans-atlantic speed record of 257 mph flying from Newfoundland to London in the same plane. This design followed the tradition of Bellanca designs in establishing records!

The Flash model makes an excellent stunt performer because of the enormous wing area and short tail moment arm. The only alteration required was the airfoil which was changed to the symmetrical N.A.C.A. No. .0012. Loops, figure eights, inverted flight, etc., can be accomplished—which proves that a stunt job does not have to look like an orange crate. A scale of one inch to the foot was used, making the wingspan 46 inches and the area 280 square inches. Weight was kept to a minimum by using a planked fuselage and silk wing covering, except for the tail surfaces which are shaped from solid balsa.

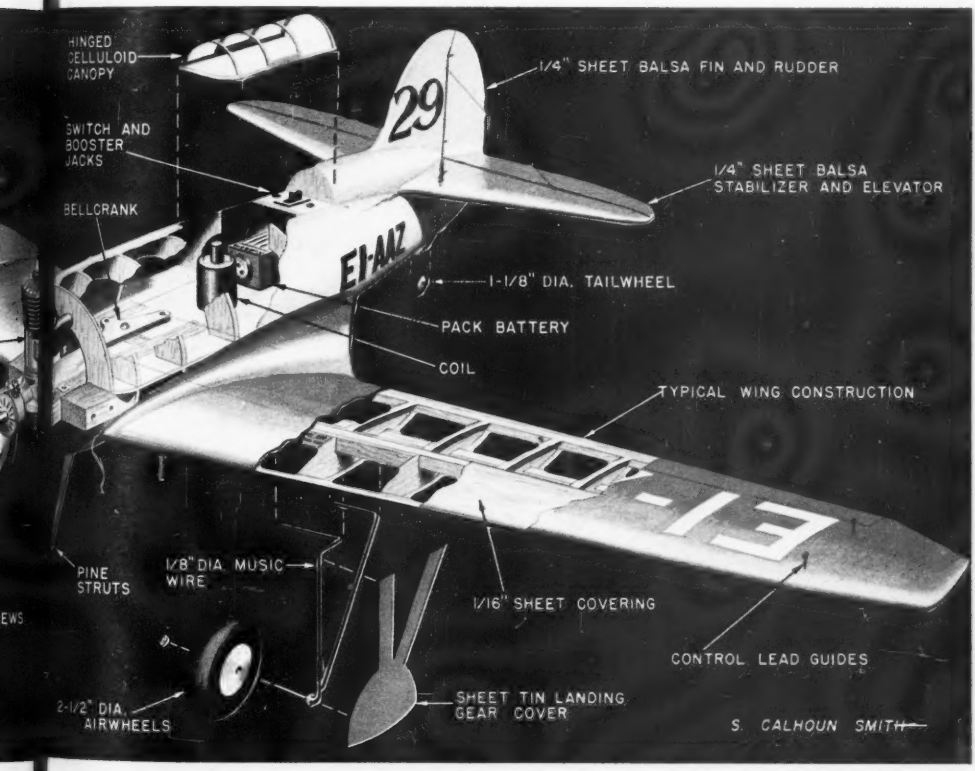
As with most model airplanes, full size working plans are a must for construction. You can either enlarge your plans from the drawings appearing on these pages or else obtain a full size set by sending fifty cents to the Mechanix Illustrated Plans Service, Greenwich, Connecticut. Ask for Plan No. 392. Before starting with the actual construction, read the instructions a few times and study the plans. You'll find it much easier in the long run to study the various construction steps before cutting your balsa.

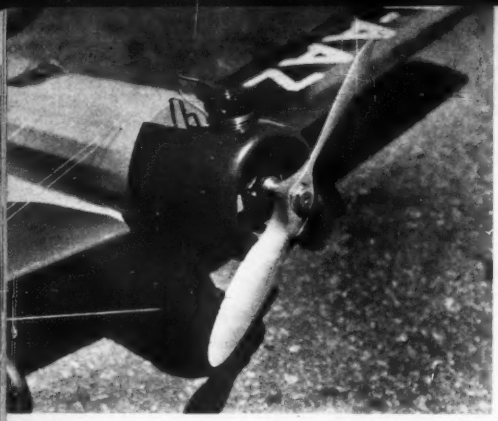
Since this model is intended for stunting as well as sport flying, most any engine from .49 to .65 cubic inch displacement can be used. A Mighty Midget is shown in the drawings but the mounts can be varied to take most any power plant.

Start by cutting out the fuselage "backbone," the formers and bulkheads and



Large wing fillet is built up from 1/16 in. sheet balsa, then covered with Silkspan tissue.

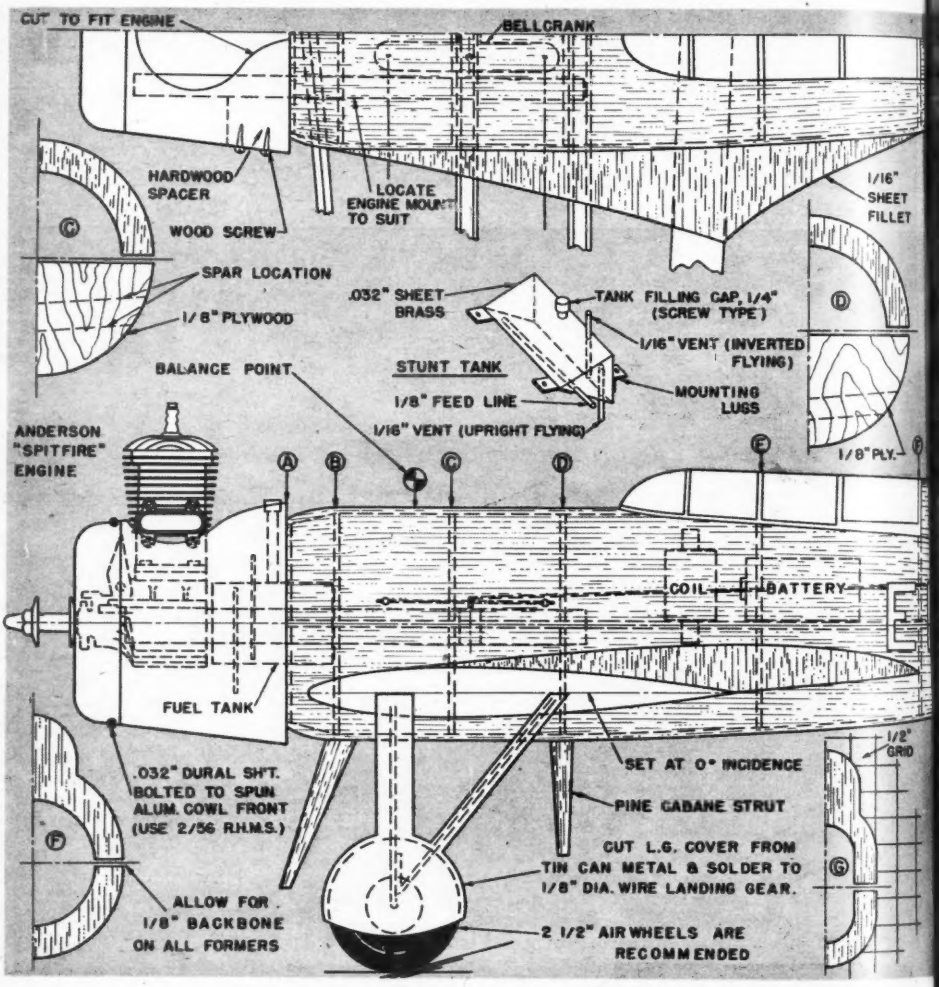




Close-up view showing nose installation with a McCoy engine installed. Cowling is aluminum.

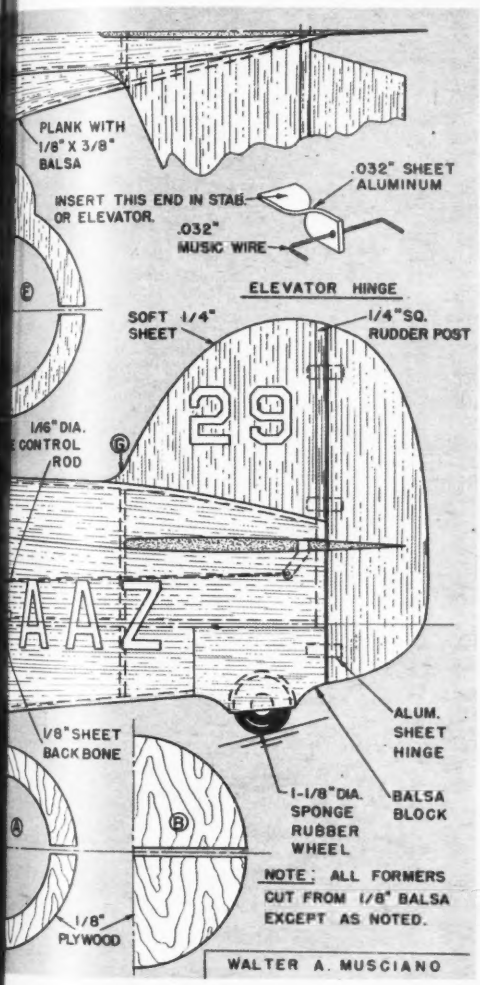
assembling them on the "backbone" after the engine mounts have been installed as shown in the sketch. While the cement is drying, cut the plywood spar joiners and assemble the hard balsa spars to the correct dihedral. The ribs are cut from ⅛ in. sheet and cemented to the spars. When dry, attach this structure to the fuselage by cementing the spars to the bulkheads C and D at the location shown. Notch the trailing edge and fit it in place along with the leading edge. Bend the landing gear from ⅛ in. dia. music wire and bind with strong thread to the spars. Cement well.

The tail surfaces can now be cut from ¼ in. stiff sheet balsa and sanded to a streamlined cross section. Install the stabilizer and elevators after they have been sanded and keep

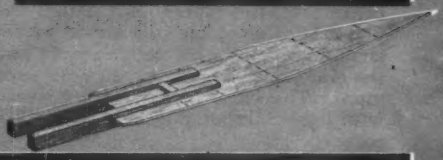


them parallel with the center line. Once this is accomplished, you can install the bellcrank and control system.

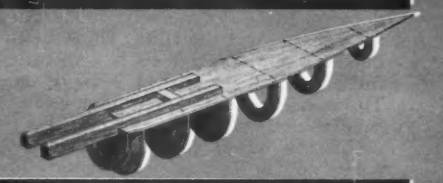
If an ignition system is used, the wiring should now be installed. Switch and booster plugs are located in the cockpit so they will not detract from the scale external appearance. In case a Glow Plug is used, which will make possible elimination of the ignition system, cement lead to the tail to balance the model at the Center of Gravity (C. G.) as marked on the plan. The wing root, leading edge and fillet are now covered with $\frac{1}{16}$ in. sheet balsa on both the top and bottom. The ribs are cap stripped with $\frac{1}{16}$ x $\frac{3}{8}$ in. balsa to reduce the sag and to prevent the ribs from buckling when the silk covering is doped. Soft



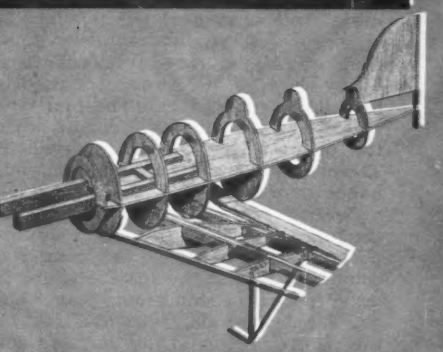
FUSELAGE CONSTRUCTION



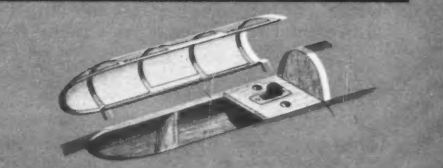
Cut "backbone" from $\frac{1}{8}$ in. sheet and cement mounts in place. Then mark off formen positions.



Trace bulkheads on prescribed stock and cut out. Cement bottom half in place, then add top.



Mount the ribs on the spars, join both wing panels and then glue assembly to fuselage.



Cockpit canopy is formed from celluloid. If ignition is used, install switch and hinge, as shown.

FULL SIZE PLANS

of this model will greatly simplify construction. Send 50c to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Please specify Plan No. 392.

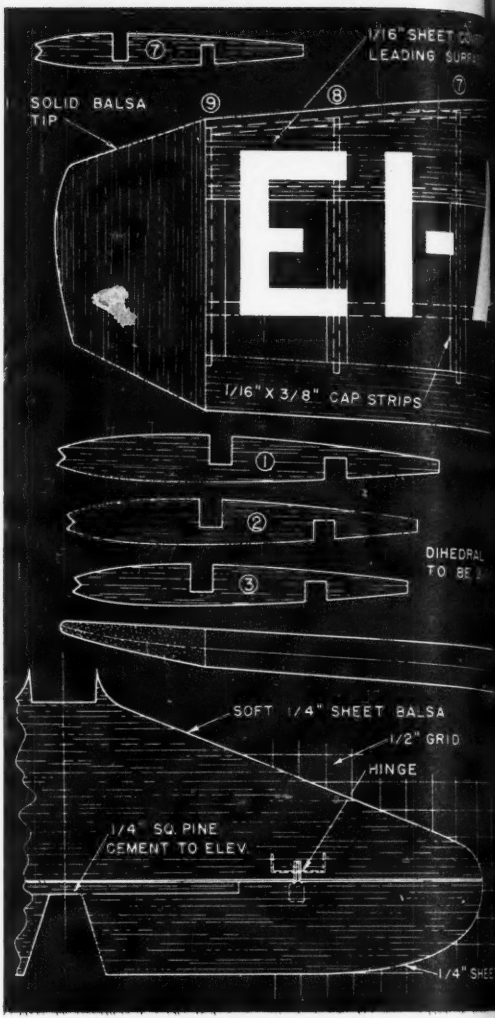
balsa tips complete the wing structure.

The fuselage is now planked with ⅛x⅜ in. soft strips—and don't spare the cement in this operation. After the planking is complete, the entire model should receive a thorough sanding and the glue joints should be gone over once more. The balsa portions are covered with light Silkspan and the wing is silk covered.

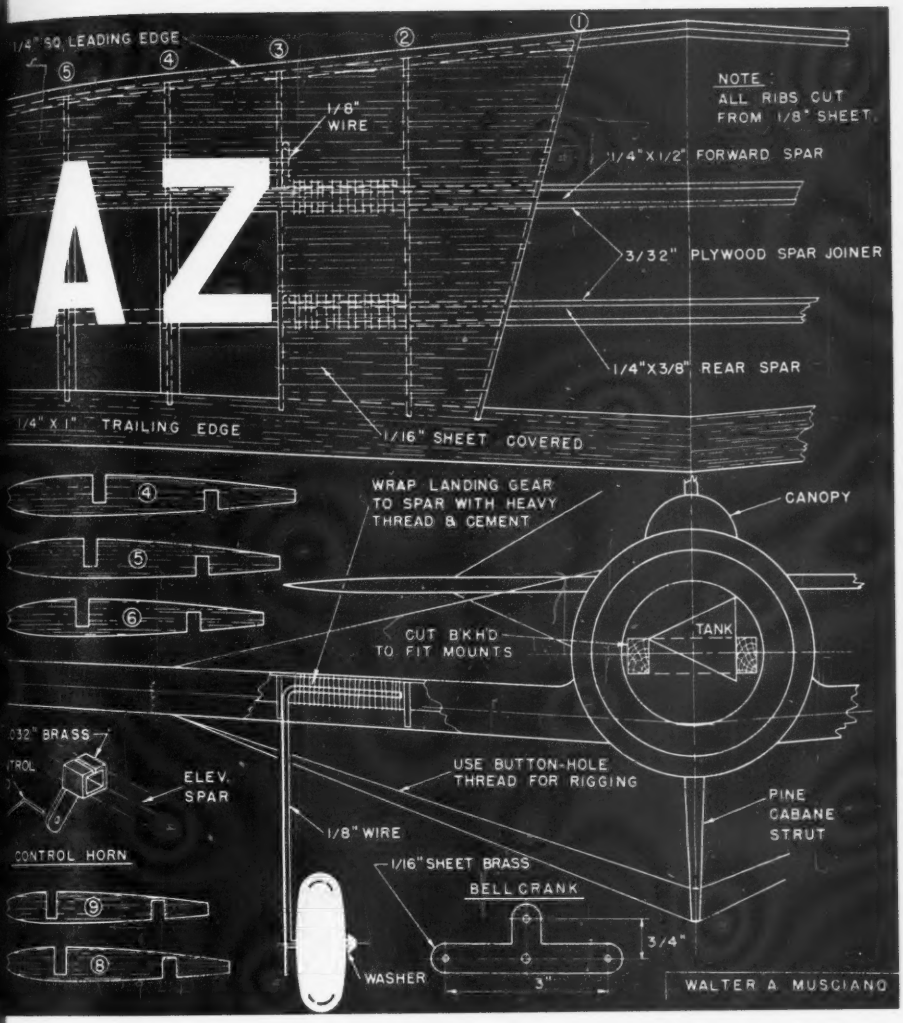
In order to obtain a fine finish, the model must be doped at least eight times. The first three coats of clear dope on the wing must be fairly thick in order to seal the silk. Thin out the dope for the next five coats with intermittent sandings with 8/0 sandpaper. The wood surfaces should be doped and sanded until smooth.

Cut the wheel covers from tin and solder to the landing gear struts. The rudder is attached with aluminum strips to allow the rudder to be set in any desired position. The rear of the cowl is made from aluminum sheet bolted or riveted to a spun aluminum cowl front which can be purchased from your local hobby shop. Wood screws are used to hold the cowl in place. The fuel tank was designed to feed the engine when the plane is upright or inverted. A Thomas tank, also obtainable from your hobby shop, is ideal.

Because of the fact that the wing on the full size design was so large in proportion to the fuselage, the wing was colored dark and the fuselage light in order to give the ship a more "racy" appearance. Emerald green was used on the wings, horizontal tail surfaces and landing gear covers, while the fuselage and vertical tail surfaces are yellow-orange. The lettering on the wing is white and black on the fuselage fin; the entire cowl red. This color scheme was



Large wing, symmetrical airfoil and short tail moment arm makes model ideal for stunting.



used on the original "Swoop" because they are the national colors of Ireland. When applying the colored dope, remember that many thin coats are better than a few thick coats.

The cockpit canopy can be built up from celluloid. The frame is made from green cellulose tape cut in thin strips. If an ignition system is used, hinge the canopy as the plans indicate. Otherwise, cement it permanently in place. The rigging wires are made from heavy grey button hole thread sewed on right through the wing from one side of the fuselage down across on up to the other side. The addition of the wheels completes the project. Air wheels are recommended because the landing gear is quite rigid. If you have any difficulty obtaining your cowl, wheels, tank or any of the material necessary for building, drop a letter to the MI Reader Plans and they will refer you to the correct firm or hobby shop. Please enclose a stamped, self-addressed envelope.

Long control lines are best for stunting. The author used seventy foot lines of stranded stainless steel—.016 inches in diameter. Shorter lines may be used but do not use thinner wire. It will be found that your "Swoop" will leave the ground after a very short run. Do not fly the plane with low power; always use at least three-quarter throttle for sport and full power for stunting. Happy landings! •

Car Care

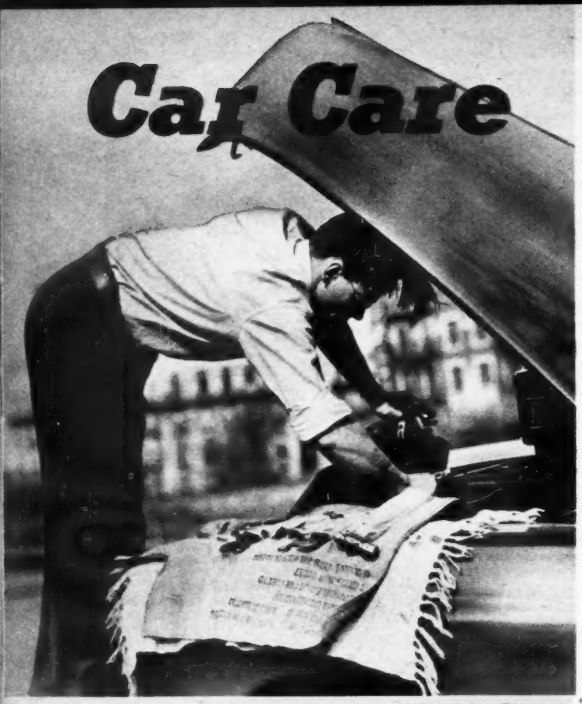


Photo by Robert Brightman

New breaker points are fine, but don't assume that you can forget all about them. Remember the little fiber rubbing block which rides the cam of the distributor shaft. In a short time this will wear down a little and the points will then not have enough gap. Reset the gap to prevent them from burning.

Radiatorstopleak compounds should be poured into the radiator only when the engine is hot.

Backfiring through the carburetor intake when nearing the top of a hill indicates that the plugs are not "hot" enough for the engine in warm weather.

The cooling system will collect more rust during fast travel because more air is sucked into the coolant around the water pump.

Gurgling in the cooling system is an indication of hot spots, usually in the water jackets or head.

Excessive ping on acceleration may be due to trouble with the vacuum control of the distributor. Always check this unit when overhauling distributor.

Low oil pressure at this time of year often is due to a heavy accumulation of scale in the engine block. This overheats the oil. Thinned-out hot oil will show a much lower pressure.

Water in the gas has been traced in some cases to leaky, locking gas tank caps with broken or loose covers. After a rain storm take off the cap and see if water drips from the lock.

This new device will guard your tires, wheels and hubs from theft. Lock itself is concealed with a small disk which can be inexpensively replaced if lost.

Burred teeth on pinion gear of starter is cause for rough, noisy starting. Check control which demeshes this gear.

BEHIND THE WHEEL

With Fred Russell

If you want a personal reply, please enclose a self-addressed, stamped envelope.

Is it a good plan to place a fine screen in the intake manifold in order to gain a better air and gas mixture? C. Sheldon Hastings, E. Jordan, Mich.
Factory engineers as well as carburetor manufacturers do not recommend this step.

My 1940 Pontiac runs very hot. Radiator has been cleaned, fan belt adjusted and a new head gasket installed. Car has 71,000 miles on the clock. Paul Moquin, Holyoke, Mass.
Chances are the motor block is very badly clogged with scale. After 71,000 miles you probably have a good deal of carbon in the motor. This raises compression and would tend to overheat the motor.

The transmission on my 1937 Dodge shakes very badly at speeds over 45 mph. John Ensenat, New York City.
Check the engine mounts. They are probably the cause of your trouble.

I have a 1947 Pontiac and only get about 10 mpg in the city and about 12 in the country. How can I increase the gas mileage? Wm. Fox, Buffalo, N. Y.
Check the ignition timing, carburetor float level and the choke valve. The latter should be wide open when the engine is hot.

I have a 1948 De Soto which leaks oil when parked on a hill. It also has a tendency to crawl forward when waiting for a light. Jack Marcus, Grosse Point, Mich.
Loss of fluid and the crawling of your car indicates a serious loss of oil in the fluid drive unit. Check with your nearest De Soto dealer.

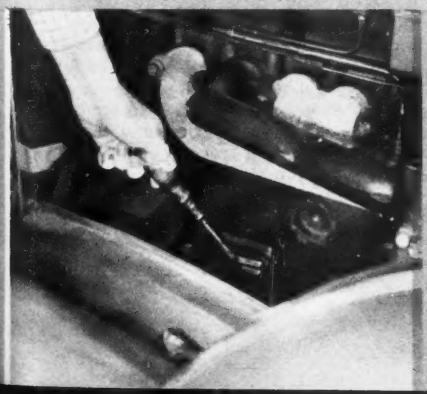
Can I change the gear ratio on my 1937 Ford? I need more power in order to pull a trailer. E. W. Huffman, Colorado Springs, Col.
Check with the Ford Motor Co. at Dearborn, Mich. You can probably get a four-speed transmission or a two-speed axle.

Is it possible or practical to connect the crankcase ventilator with the carburetor intake in order to burn the oil fumes which come from the crankcase? Guy Seville, Newport, N. H.
Yes, it is practical. In fact, I had such an arrangement on one of my cars. You would need to readjust the carburetor a little as the mixture is changed by the admission of air and vapors into the intake. There are, however, some disadvantages. You could easily try it as an experiment.

Intake and exhaust manifold nuts should be tightened occasionally. Leakage here disturbs carburetor mixture; causes poor low speed performance.

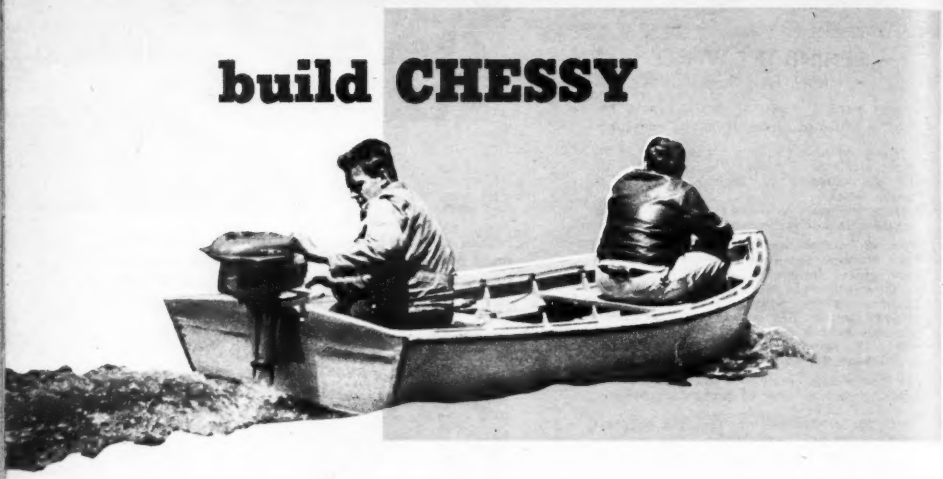
Loose bumpers are the reason for many a perplexing rattle. Since bumper brackets are fastened to the frame under the body, they are usually overlooked.

Engine crankcase vents are often in inaccessible or easily overlooked spots. Check them, they should be kept clean if ventilation is to be normal.



Wandering and similar steering difficulties may be due to insufficient play in steering wheel. About 1½ in. should be evident before front wheels move.

build CHESSY



This strongly built 15-ft. Chesapeake skiff may be easily rowed or driven by an outboard motor.

BY ERNEST TUCKER

MEET THE DESIGNER

Your Editors are proud to present this tested design by young, up-and-coming Yacht Designer Ernie Tucker. A native Marylander, he has been designing, building, and sailing boats on the Chesapeake since he was 13 years old. With a background of years of experience at such outfits as the Owens Yacht Co. and the Annapolis Yacht Yard, he has just opened his own design office.

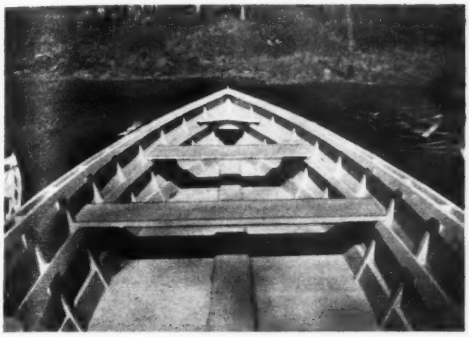
This bow-on view of Chessy clearly shows her rugged construction and useful roominess. You may have to notch the transom for the outboard.

WHEN the soft southerly breezes blowing on your fevered brow and the moist, salty tang of marshes tingling in your nostrils make you long to get out on the water, then, Brother, the bug has bitten you and it's time to think about building a boat. *Chessy* is just the ticket to get you acquainted with the sport. She is strongly built so she'll take a beating when you drag her up on sandy beaches or push her into marsh grass with its inevitable hidden snags and roots. She has plenty of flare, which will keep her dry when the going gets rough—and she is steady enough on her keel to enable the soft-crabber to stand in her bow and reach for a fast-moving crustacean without having the feeling of walking a tightrope.

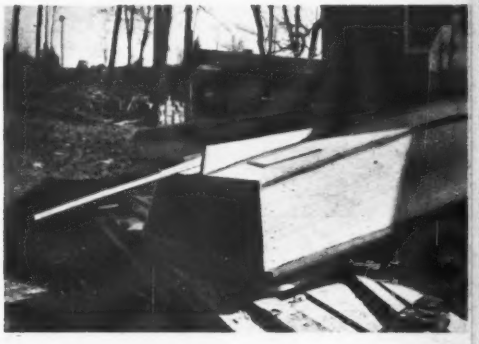
Her sides should be cedar or cypress and should be as free from loose knots as possible. If you use cypress, avoid brashy wood with raised grain, which will eventually warp and splinter. Two 10-in. and

To impart in jiffy time that mirror-smooth finish that we all admire on a fine boat, use a power sanding machine.

After sanding, give the entire hull a coat of good-quality marine-grade priming paint.



Here the seat risers and seats have been installed. To prevent sag, the center seat supports are next added.



On the bottom go a triangular-shaped skeg and a keel for protection against damage.

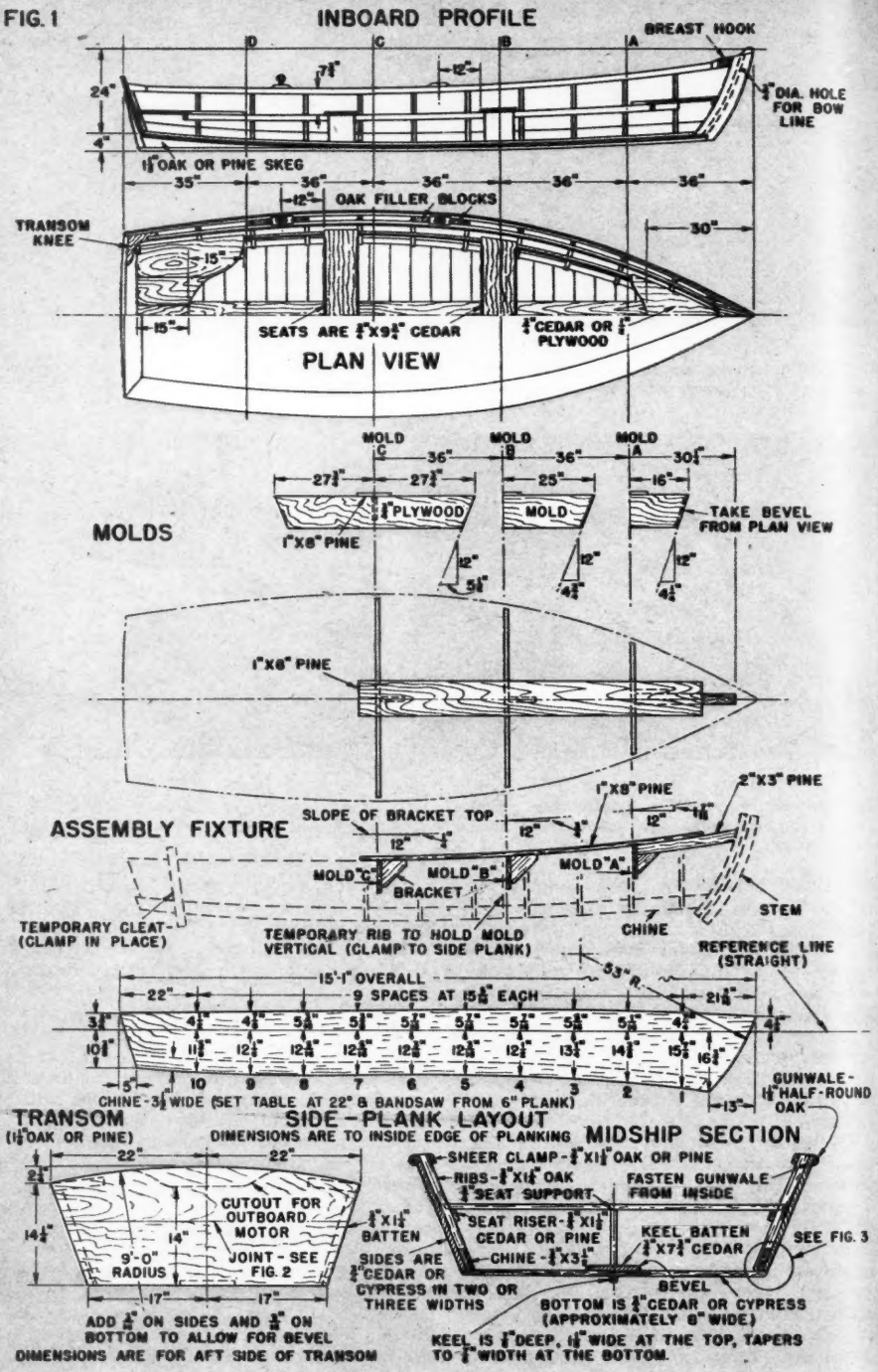
two 12-in. boards are recommended, but ones as narrow as 8 in. can be used. Plane the edges straight and square so the planks will butt snugly against each other. Place enough of the boards together to get the necessary width and, using the side-plank layout, Fig. 1, as a guide and a long batten to insure fair lines, draw in the curves to which the sides are cut; then cut out. Repeat this process with the other side and mark the centerlines of the 10 ribs on each side.

Next, cut the chines from a 10-in. plank, sawing at about 22° from square and—remembering that they are opposites, not duplicates—being sure to run the second chine through the saw the opposite way from the first. The 22° cuts will save work in fairing up the bottom edges, which must be done before the bottom planking is applied, and will also prevent the upper edges of the chines from forming water-catching pockets. Notch the chines at each rib location, as shown in Fig. 3, making each notch ¾ in. wide and ¼ in. deep at the top and tapering it to ⅛ in. deep at the bottom. This taper is the easiest and strongest way of notching the ribs into the chines. Cut the ribs a little longer than the width of the side planks—they can be cut off later on.

Now fasten about four ft. of each chine to its side, keeping the forward end back far enough to clear the stem, which will be installed later. Be sure to put a good thick coat of paint on all surfaces before they are fastened together. Nail the first four ribs through the chines and clamp the planks together to make sure the seams are hard up against each other; then nail through them into the ribs.

We are now ready for the stem. Lay it out as shown in Fig. 4. Saw to shape; then take a piece of wood the same thickness as the side planks and, using a sharp chisel, cut out the groove so the sample of plank-

FIG. 1

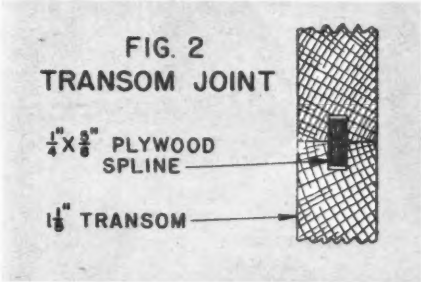

INBOARD PROFILE
BREAST HOOK
DIA. HOLE FOR BOW LINE
OAK OR PINE SKEG
OAK FILLER BLOCKS
TRANSOM KNEE
SEATS ARE X9 CEDAR
CEDAR OR PLYWOOD
PLAN VIEW
MOLDS
MOLD
PLYWOOD
MOLD
TAKE BEVEL FROM PLAN VIEW
1"X8" PINE
1"X8" PINE
ASSEMBLY FIXTURE
SLOPE OF BRACKET TOP
1"X8" PINE
2"X3" PINE
MOLD "C"
MOLD "B"
MOLD "A"
BRACKET
STEM
CHINE
TEMPORARY CLEAT-(CLAMP IN PLACE)
TEMPORARY RIB TO HOLD MOLD VERTICAL (CLAMP TO SIDE PLANK)
REFERENCE LINE (STRAIGHT)
15'-1" OVERALL
9 SPACES AT 15 EACH
CHINE-3 WIDE (SET TABLE AT 22° & BANDSAW FROM 6" PLANK)
GUNWALE-HALF-ROUND OAK
TRANSOM
(OAK OR PINE)
SIDE-PLANK LAYOUT
DIMENSIONS ARE TO INSIDE EDGE OF PLANKING
MIDSHIP SECTION
CUTOUT FOR OUTBOARD MOTOR
9'-0" RADIUS
JOINT - SEE FIG. 2
BATTEN
SIDES ARE CEDAR OR CYPRESS IN TWO OR THREE WIDTHS
SHEER CLAMP-X1 OAK OR PINE
RIBS-X1 OAK
SEAT SUPPORT
FASTEN GUNWALE FROM INSIDE
SEAT RISER-X1 CEDAR OR PINE
KEEL BATTEN X7 CEDAR
SEE FIG. 3
CHINE-X3
BEVEL
BOTTOM IS CEDAR OR CYPRESS (APPROXIMATELY 8" WIDE)
KEEL IS DEEP, WIDE AT THE TOP, TAPERS TO WIDTH AT THE BOTTOM.
ADD ON SIDES AND ON BOTTOM TO ALLOW FOR BEVEL
DIMENSIONS ARE FOR AFT SIDE OF TRANSOM

ing comes flush with the forward line (rabbet) and leaves at the aftermost line (bearding). To complete, taper the forward end as shown, either on a bandsaw or with hand tools.

The transom is gotten out next. Keep the number of seams to a minimum. A ¼-in. spline goes in each joint, as shown in Fig. 2. The saw is set to 10° when sawing off the ends and to 26° when cutting the bottom edge. The dimensions shown in Fig. 1 are for the small face—be sure to add sufficient stock to allow for the bevel. Fasten battens to the transom to hold it flat while installing in boat.

Nail each side to the stem, using a strand of candlewicking and thick paint to insure watertightness. Make up the assembly fixture from rough lumber, as shown in Fig. 1, and nail its forward end to the aft face of the stem. Force Mold "A" down even with the top edges of the side planks and nail and clamp to Rib No. 2. Pulling in the stern gradually, fasten the remainder of the ribs in place. The chines will slide aft approximately ¼ in. by the time the sides are pulled in to meet the transom. After the [*Continued on page* 158]

Here's the stem bandsawed to shape and with the rabbets for the sides chiseled out. Now taper to the front edge, as shown in Fig. 4.



BILL OF MATERIALS

(Approximate Quantities Required)

White Oak

(Specify that wood is to be used for boatbuilding; is to consist of first, second, and select grades only; and is to be air dried to a maximum of 15% moisture content.) Ribs and Transom Battens: 39 lineal ft., S4S ¾" x 1¼".
Sheer Clamp: 28 lineal ft., S4S ¾" x 1½".
Keel: 14 lineal ft., S4S ⅞" x 1⅛".
Transom and Skeg: 8 sq. ft., S2S 1⅛".
Gunwale: 32 lineal ft., 1½" half-round.
Breast Hook, Transom Knees, and Rowlock Chocks: 30 lineal in., S4S 1½" x 8".
Stem: 30 lineal in., S4S 2¼" x 7".

Cedar or Cypress

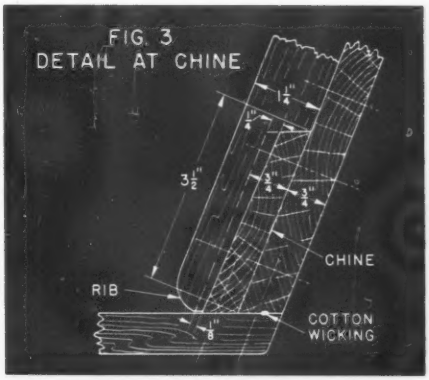
(Specify that wood is to be used for boatbuilding; is to consist of A and B grades only; and is to be air dried to a maximum of 15% moisture content.)
Sides, Bottom, Chine, Keel Batten, Seats, Seat Risers, and Seat Supports: 180 board ft., S2S ¾".

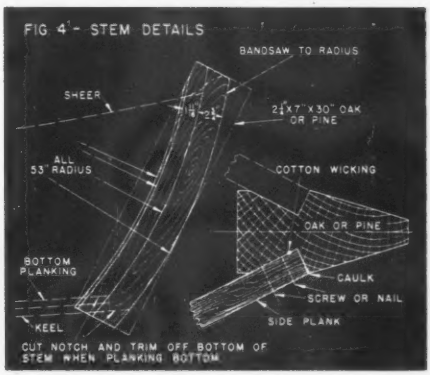
Fastenings

4 d. galv. nails: 1 lb.
6 d. galv. nails: 5 lbs.
8 d. galv. nails: 1 lb.

Miscellaneous

Bow Line: ½" manila.
Rowlocks: Size No. 1.
Oars.: 7 ft. long.
Paint: ¼ gal. primer.
¼ gal. semigloss.
¼ gal. antifouling.





LARGE - SCALE PLANS

of Chessy will greatly simplify construction. Send $1.00 to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Conn. Please specify Plan No. B-157.

Pyramidal Bookcase

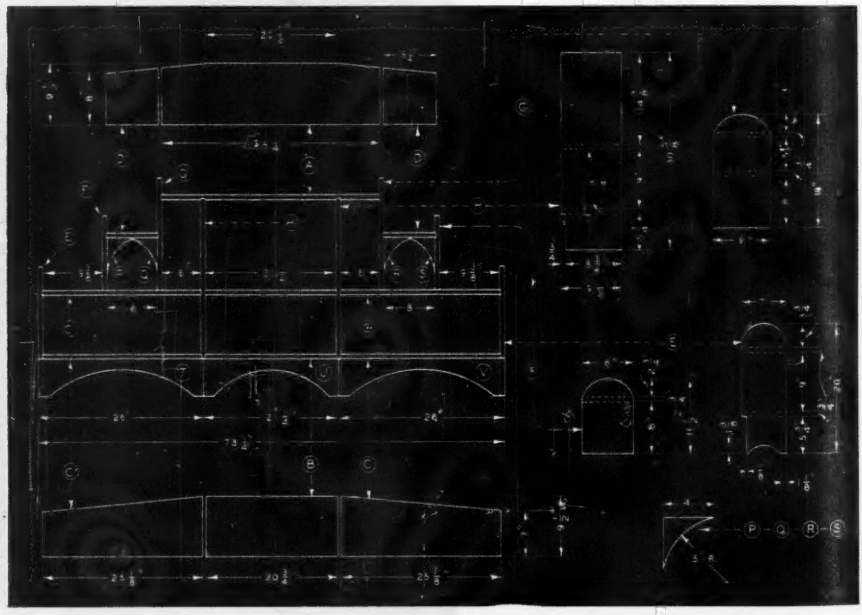
Here's a living-room piece that has an interesting design.

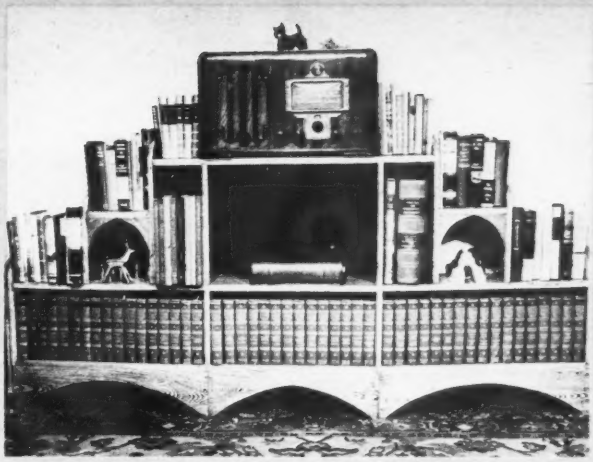
BY TOM FARLEY

THIS simply constructed, unusual bookcase has space galore for books, records, radio, record player, and so on. The pyramidal arrangement offers a pleasant change from the rectangular lines of most home-made pieces and the handy grottoes —or knickknackatories—furnish convenient repositories for your favorite pieces of bric-a-brac. The capacity of the shelves is about 100 books and six to eight record albums. Ash was used in the original, but shelving pine or any hardwood could be substituted.

Lay out and cut all pieces from 1-in. stock that is dressed down to ¾-in. net thickness. With hammer and chisel, cut ⅛ x ¾-in. dadoes, as shown. For maximum strength, make

Dimensions for all pieces, which are made from ¾-in. stock, are clearly given below.



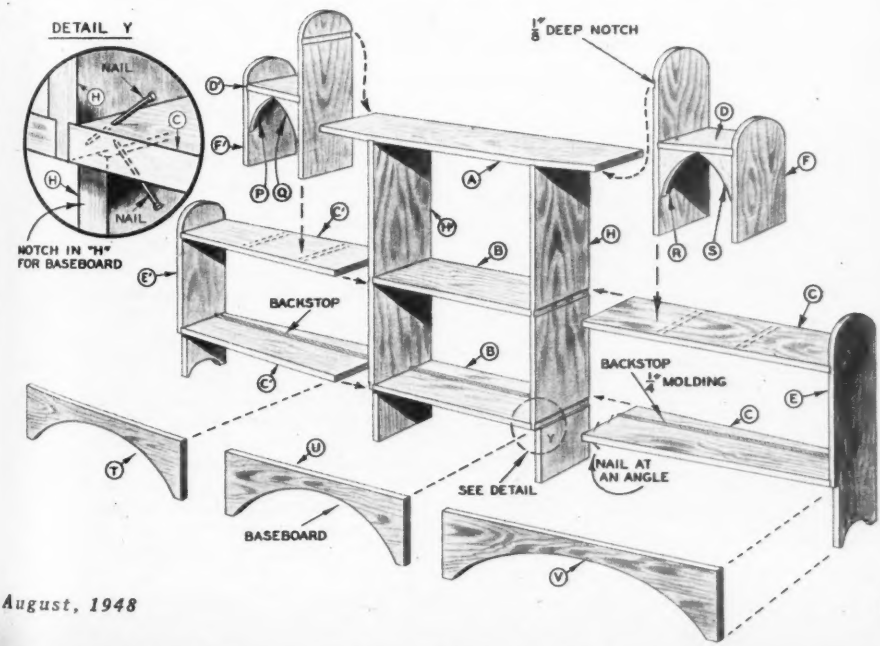


Two knickknackatories, for displaying bric-a-brac, are integrated features of this commodious workshop project.

these dadoes slightly undersize so the stock will have to be tapped together with a mallet. Sand all parts after completing this operation. To keep books on the bottom shelf in line, tack on strips of ¼-in. quarter-round molding for backstops.

Start assembly with the center section, driving 2-in. finishing nails straight through pieces H and H′ into the two pieces B and through piece A into pieces H and H′. Four nails at each joint should suffice. Next add the two lower wings, which are mirror images of each other. Pieces C and C′ will have to be toenailed to pieces H and H′, as shown in Detail Y. The two upper wings are also mirror images of each other. To lessen the danger of splitting, cut pieces P, Q, R, and S with the grain running diagonally. These latter pieces are attached with 1-in. finishing nails. Complete the assembly by adding the baseboards, pieces T, U, and V; then set all nails and fill all nail holes and crevices with plastic composition wood.

For a good finish, apply one or two coats of stain and then two coats of varnish, sanding between coats. A high gloss may be obtained with furniture polish. •



MODERN DESK
FOR YOUR DEN

BY HARRISON NEUSTADT

This professional-looking design is smartly styled in fancy plywood for fabrication by the skilled amateur.

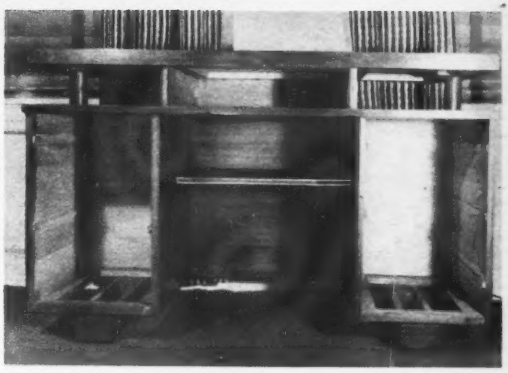
HERE'S a project that's strikingly clean in design and surprisingly spacious in content. While scarcely a "first project" for the beginner, it's still not too difficult to construct. It answers that perennial question of where to store such items as accounts, correspondence, record albums, and stationery that one invariably collects. The generous drawers, completely free from the usual over-and-under support-member obstructions, offer fine hideaways for much extra paraphernalia. And large magazines and books have their own commodious shelves flanking the center drawer.

You'll need five or six 2 x 4-ft. sheets of $\frac{13}{16}$-in. hardwood-surfaced plywood, a 4 x 4-ft. sheet of $\frac{1}{4}$-in. fir or gum plywood, a 2 x 3-ft. sheet of $\frac{3}{4}$-in. fir plywood, some $\frac{1}{2}$-in. stock for the drawers,

veneer strips for finishing (of the same material as the hardwood surface on the $\frac{13}{16}$-in. plywood), and some solid hardwood stock, again to match the $\frac{13}{16}$-in. plywood, for trim.

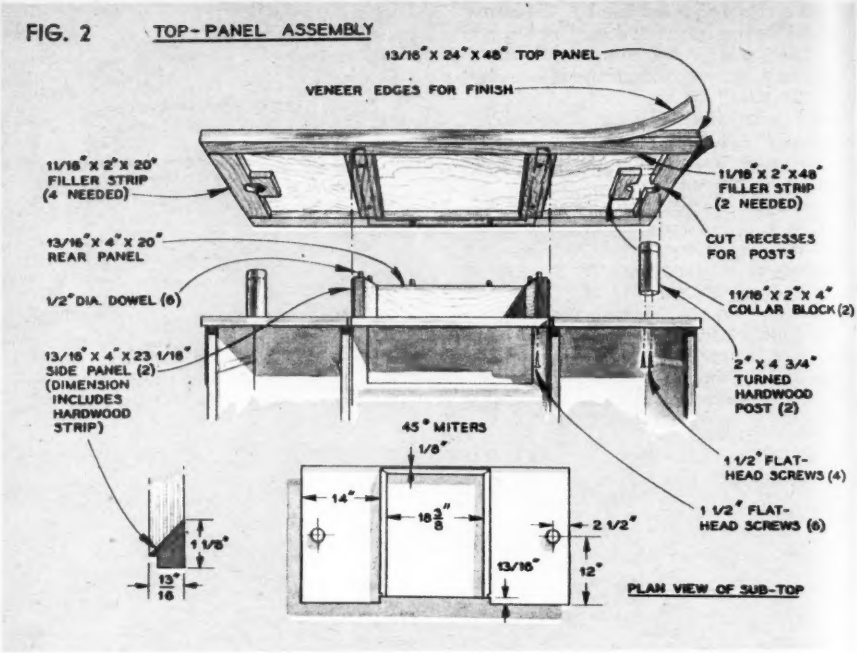
Start with the two base assemblies shown in Fig. 1. The 3 x 4 x 21-in. blocks can be made up, as detailed, from plywood, or fashioned from one solid piece of hardwood. Fastened to these are the two 13⅜ x 22⅞-in. plywood platforms on which the desk proper sits. The V-shaped corner notches that take the hardwood strips are cut to the size shown in the detail.

The four vertical panels and the back panel are prepared next. Each panel is mitered along its two vertical edges and top edge, as shown in Detail "B." Cut a



Evident here, just prior to fitting the drawers, is the heavy construction that imparts rigidity.

FIG. 1 GENERAL ASSEMBLY AND JOINTS



½ x ¾-in. rabbet in the bottom edge of each piece. Note that this rabbet in the back panel runs only between the vertical end and inside panels. The hardwood strips that are applied to the front edges of the four vertical panels are mitered and rabbeted as shown in Detail "B" and run from the bottom edges of the platforms to $\frac{13}{16}$ in. below the top edges of the panels, as indicated in Detail "A." These strips serve to cover the unsightly rough edges of the plywood and the rabbets in them provide finger space for opening the drawers. Attach the five panels to the platforms by means of screws driven upwards through the platform bottoms.

Next, miter the 24 x 48-in. sub-top and fasten it to the vertical panels. If you want to get really fancy, rabbet both it and the back panel and insert a hardwood strip, as shown in the detail at upper right of Fig. 1. Cut a $\frac{13}{16}$ x 20-in. notch in the front of the sub-top and add a 4-in. finger recess; then finish off all edges with hardwood veneer strips, as indicated. To complete the work in Fig. 1, cut and install the 11¾ x 20-in. shelf.

The top panel and its supports are detailed in Fig. 2. Three pieces of plywood—with hardwood strips, as before — are cut as shown and screwed to

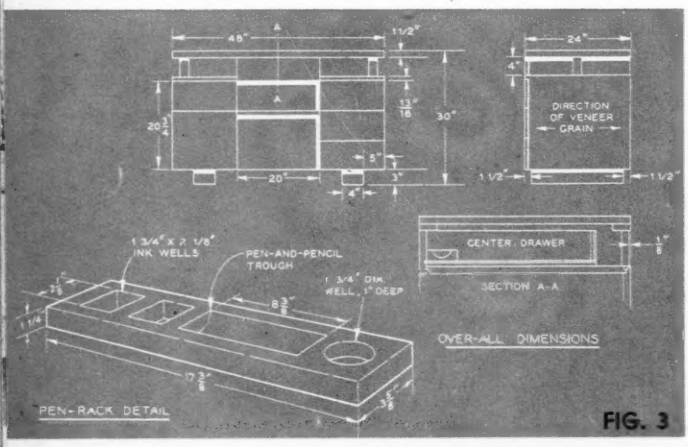
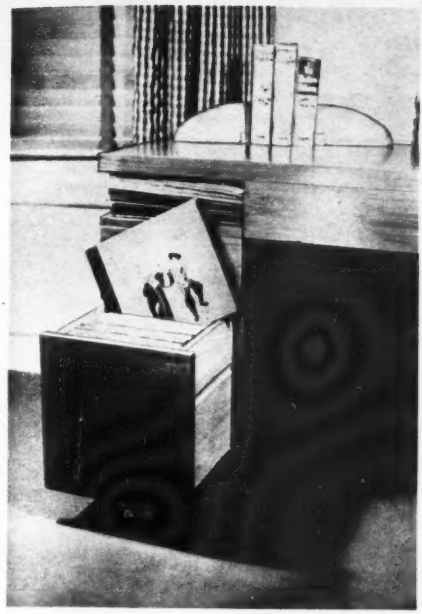


FIG. 3



On the left side of the desk is a deep drawer that's just right for files or record albums.

the sub-top. The top panel is reinforced with $\frac{11}{16}$ x 2-in. pieces and fastened to the sub-top by means of dowels into the three pieces of plywood and two decorative round posts. These latter can be turned or cut from the wooden cores on which rugs are shipped, which you can procure from your local department store's receiving department. Veneer strips finish off the edges of the top panel.

One center drawer, four shallow side drawers, and one deep side drawer are constructed as in Fig. 4. All drawer sides are dadoed into the front panels, and the rear panels are dadoed into the sides. The sides are grooved for the ¼-in. plywood bottoms. The track grooves on the outside should be cut before assembly. Using these grooves as guides, install the track rails from which the drawers hang, as shown in Fig. 1. Apply veneer to the edges and tops of the drawers. No handles are needed. Complete the desk by constructing the pen rack shown in Fig. 3 and setting it in place in the center drawer.

The quality of the finish can make or break your project; so take pains here. Apply a good filler to all hardwood surfaces, wiping it in well. Follow with several coats of varnish or lacquer; then wax. •

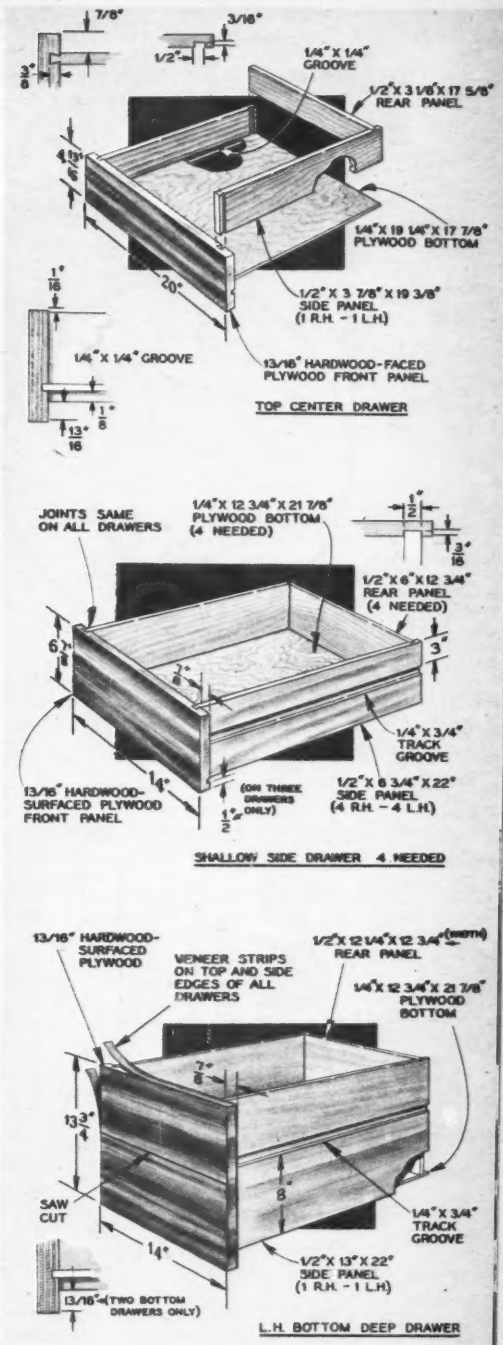
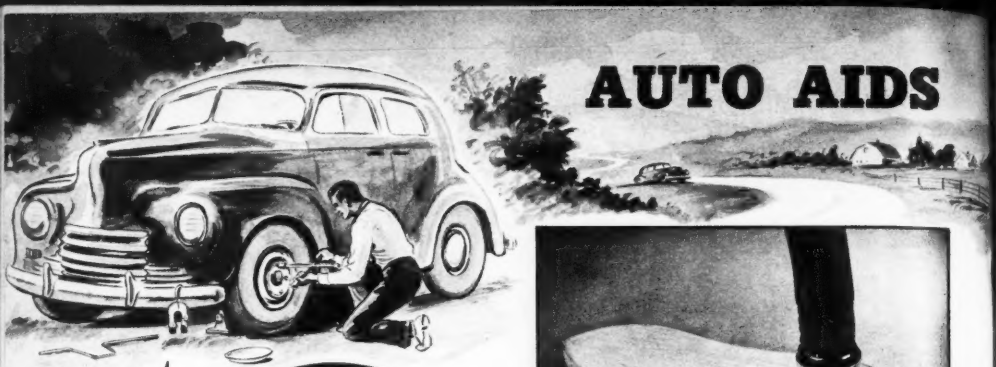
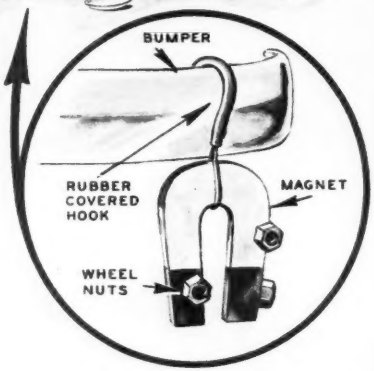


FIG. 4

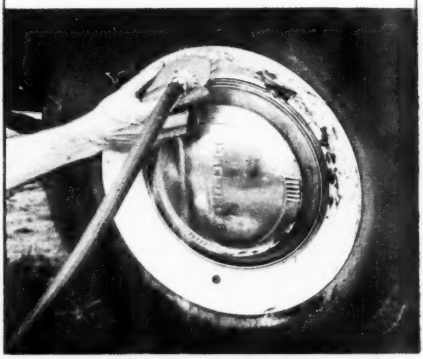
AUTO AIDS

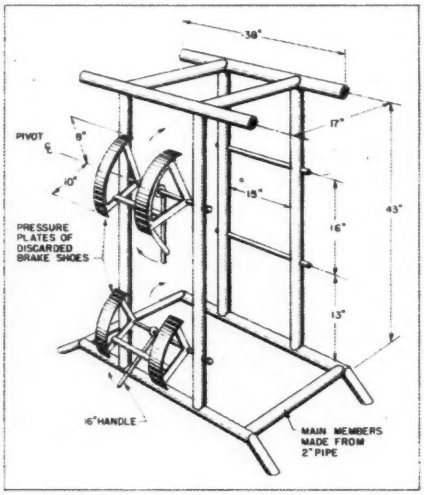




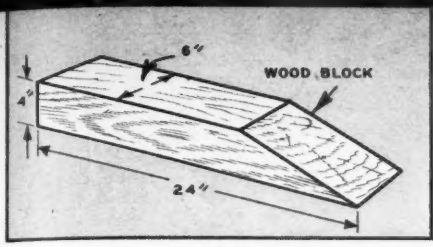
No More Lost Nuts. Especially handy when changing a flat in a grassy spot is this magnet for holding on to the wheel nuts. Suspend it from the bumper with an S-shaped hook as shown above.

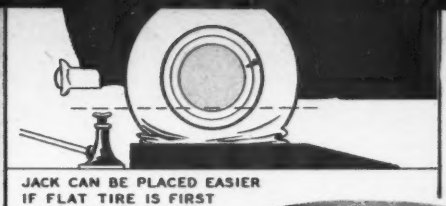
Wheel Scrubber. Bore a 5/8 in. hole through one end of a floor brush. Flatten the hose clamp and insert coupling in the hole. Use three brass screws to secure the clamp to the top of the brush.

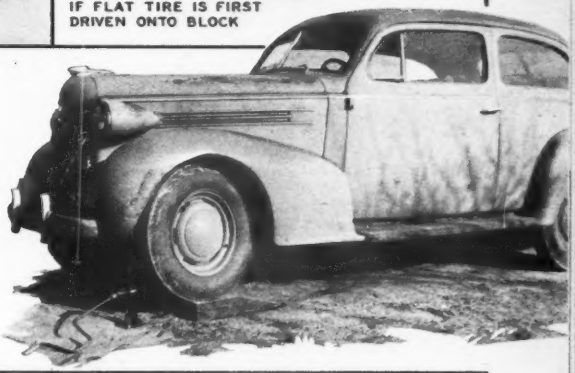




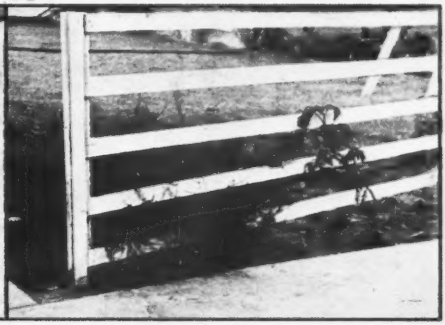
Safety Rack. Dozens of tire repairmen are injured yearly when the rim is blown off high-pressure truck tires during inflation. Prevent such injury with this rack.



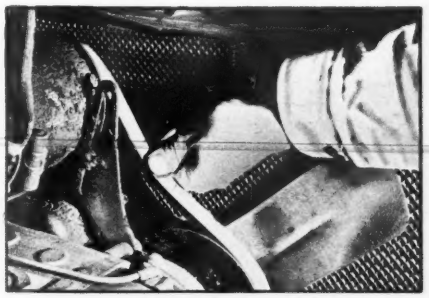




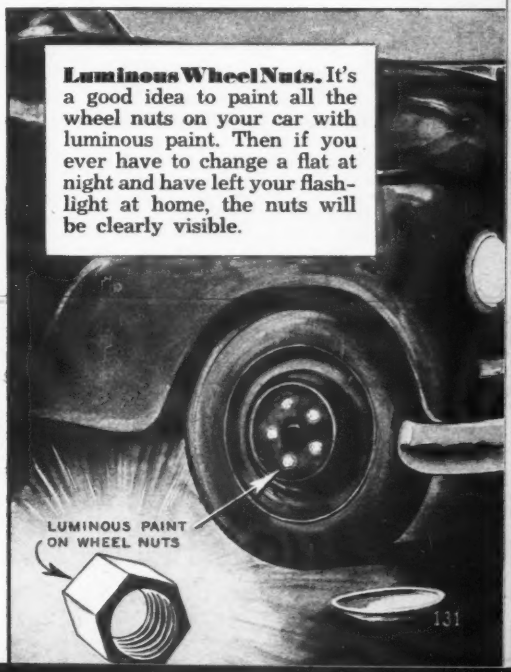
Flat Help. A 2 ft. piece of 4x6 in. lumber, beveled on one end as shown above, is a great help in jacking up today's low slung cars. Drive the flat up on it and you will find ample clearance for the jack. Be safe, use axle jack.



Use For Old Crankcase Oil. Posts and fences that are in contact with the soil will last about five times as long if first immersed for a few hours in a fifty-fifty solution of oil and kerosene. See above.



Fan Belt Adjustment. The fan belt will slip if too loose and if made too tight strains the bearings of the generator and water pump. The proper adjustment is indicated when you can press the belt in or out 1 in. without exerting too much pressure. See the photograph above.



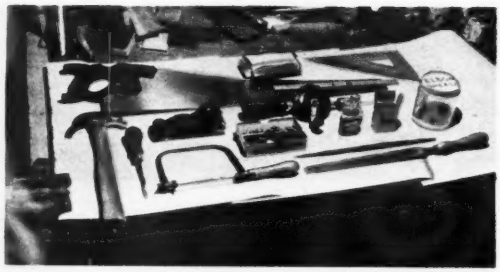
Luminous Wheel Nuts. It's a good idea to paint all the wheel nuts on your car with luminous paint. Then if you ever have to change a flat at night and have left your flashlight at home, the nuts will be clearly visible.

Tot's Vanity Table

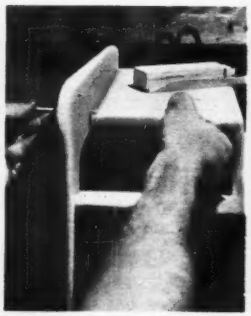
BY HENRY CLARK

LAST Christmas a relative gave our four-year-old daughter a pink plastic comb, brush, and mirror set. After fussing with these feminine instruments in typical little-girl fashion, she'd usually wind up by leaving them forgotten on a shelf, her play table, a chair, her dresser, or even the bed. Her mother would be right behind her each time, muttering something about the need for a dressing table.

Finally taking the hint, I secured 40 in. of ¾x8-in. white pine, 6 ft. of ¾x12-in. white pine, and a 4-ft. length of ½x6-in. gum. I knocked out the bench—a real cinch—first, assembling it, as shown, with flathead screws. A scroll saw was used on the bottom cutouts. The 6-ft. plank was cut into the table's side uprights and main horizontal piece and, after trimming and sanding, these three basic pieces were assembled, again using flathead screws. A lower horizontal brace and two utility shelves were then added to give the piece rigidity.

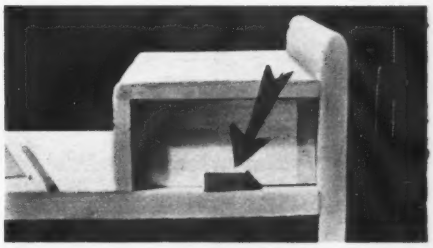


Above. These simple tools are all you'll need when making the vanity, the most essential "tool" of all being the jar of elbow grease at the right. Below left. Dowels are used when installing the shelf tops. Below right. The vanity top warped; so screws were used to force it up into place.



Each drawer bottom is cut a little oversize and pressed and glued in. Paint only drawer fronts.

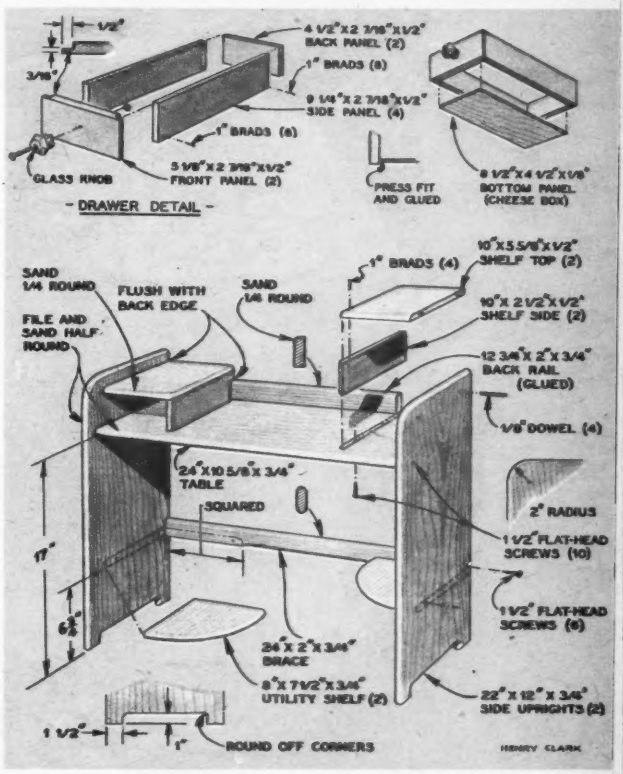
Above. When cutting out and assembling drawers, check them constantly with the recesses in which they'll go to insure proper fit. Below. A stop block is glued at the rear of each compartment.

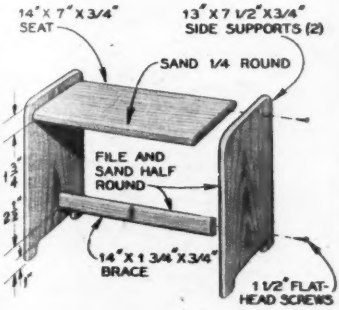


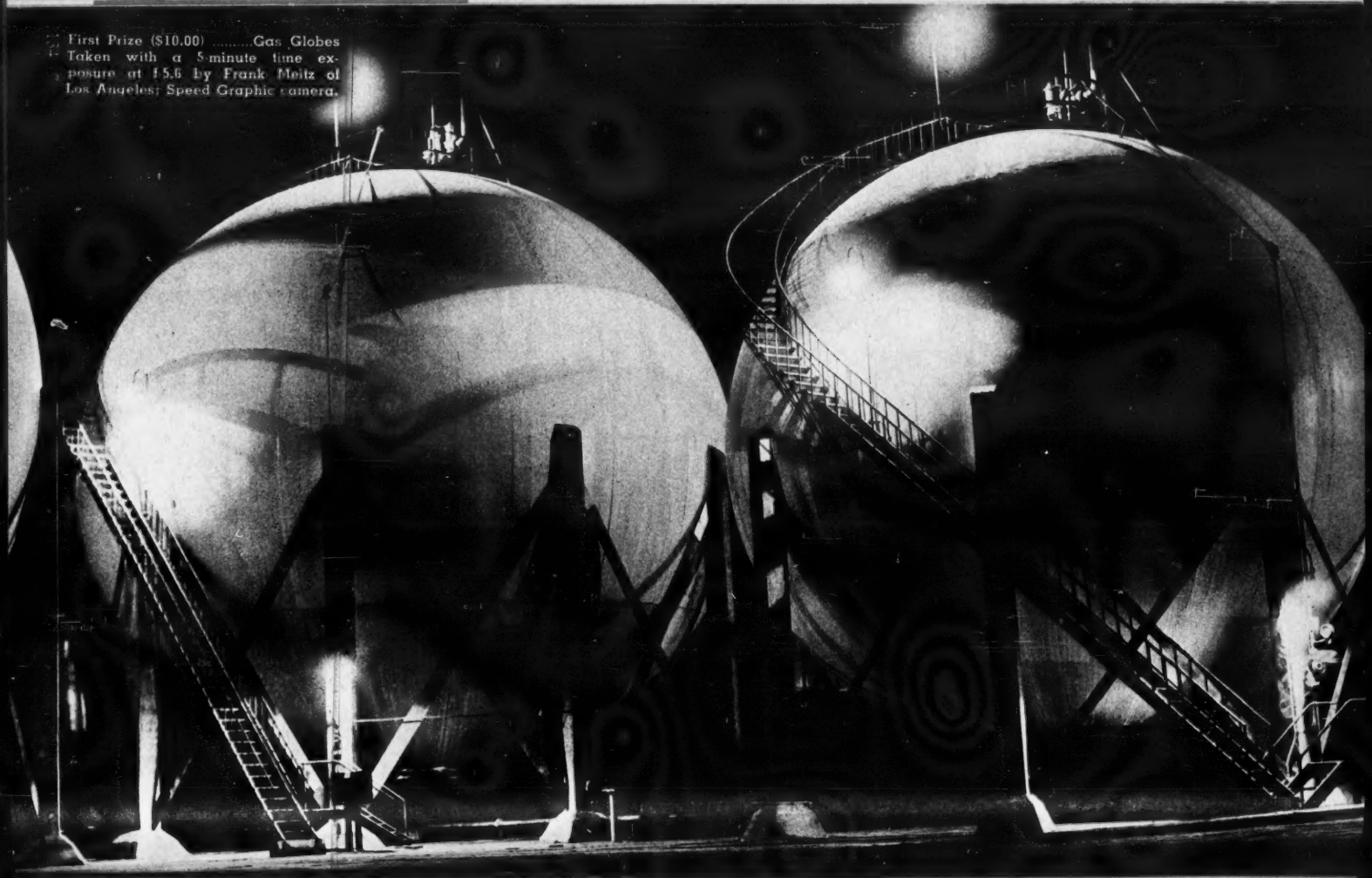
Next, I added the shelves and shelf supports that frame in the two drawers, cutting them from ½-in. stock and securing them as indicated. Much sanding was necessary to achieve the smooth, round, modern feeling in these shelf sections. The ¾-in. brace between the two was then fitted and glued into place.

The drawers were cut out last and carefully squared before assembly. I made the bottoms from ⅛-in. stock salvaged from an old wooden cheese box. The final step in assembling the drawers was to attach a glass knob to each. To avoid the necessity of fitting a panel at the back of each drawer recess, I merely glued blocks of wood to the table top to act as stops.

For a finish, I applied two coats of pink enamel, obtaining the proper hue by mixing red and white to suit and sanding between coats. Varnish over the second coat insured a clean color permanently. I figure that the vanity will serve our daughter right up until the time she's eight years old. •







First Prize ($10.00) .....Gas Globes
Taken with a 5-minute time exposure at f 5.6 by Frank Meitz of Los Angeles; Speed Graphic camera.

Monthly Photo Contest

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Address all entries to: Photo Contest Editor, MECHANIX ILLUSTRATED, 67 W. 44th St., New York 18, N. Y.

$5.00 Award .....**The Road Home**
Taken with a real old-timer, a Kodak 3A Autographic camera by A. Allen of Montreal, Can.

$5.00 Award .....**Diane**
A charming study of a charming subject by Ruth Mackus of Grandville, Mich. An indoor photoflood shot.

$5.00 Award .....**Sad Sack**
Afternoon sunshine plus a light yellow filter turned the job for Wesley Reid of Minneapolis.

to diffuse . . .

An example of slight, pleasing diffusion due to the softness of the late afternoon sun and the slight softening inherent in enlarging.

. . . or not to diffuse

By Jacob Deschin, Camera Editor, The New York Times

DIFFUSION is a preference. You like it or you don't. The trend today is to sharp pictures, just as years ago it was in the opposite direction. But many workers like to take a middle course somewhere between wire-sharp and ultra-fuzzy.

There are times when sharpness is not a matter of preference but of fidelity to the subject. You will want to keep the image sharp, for example, where you want to render texture or reproduce fine detail.

On the other hand, there is much to be said for image diffusion not only as a vehicle of personal expression, but also as a means for correcting mechanical photographic faults.

When the subject of diffusion is brought up, it is usually in connection with portraiture. Should we keep faces sharp, or

Note the difference between the sharp photo, above, and the diffused print at the right. The photograph below is out of focus.

should we soften them? And how sharp or how soft? Some will concede a woman's face might be diffused, but never a man's. The arguments become rather heated at times, so strong is the conviction of some workers on one side of the question or the other.

What, then, are the merits of diffusion? Well, take portraiture. A good lens, critically focused on a subject, produces an image more sharply defined than normal human vision can resolve it. Except in the bright outdoors, we do not usually see people's faces under lighting as strong as the floods and spots we use for photography. Normal indoor illumination is much weaker, and it tends to be of a yellow hue so that the subject's features appear naturally soft, therefore, we either say that it flatters the subject (which it sometimes does), or else announce that it does not do the subject justice. People, particularly the subject and his immediate family and friends, are not likely to quarrel with a sharply delineated print which flatters. But they and everyone else will strenuously object if a wire-sharp result tends to reveal blemishes and pimples. We all want to look at least as *good* as we do.

Why doesn't the camera give credit to a subject's features where credit is due? Many factors are involved—lighting, pose, expression, etc. One of the most important is the great difference in tonal range that can be seen by the human eye in comparison to the relatively limited range of photographic materials. By diffusing the

Diffusion without special manipulation was obtained by using fluorescent light to make exposure.

printed image, we attempt to give an impression nearer to the visual experience than is possible with the sharp record.

Basically the characteristic of diffusion is to spread the light by one means or another in order to thin out the thicker densities by partially spreading them into the shadows or to dilute highlights with spreading shadows—depending on the method adopted.

Diffusion may be employed on either or both of the following counts:

1. To correct moderate mechanical faults.

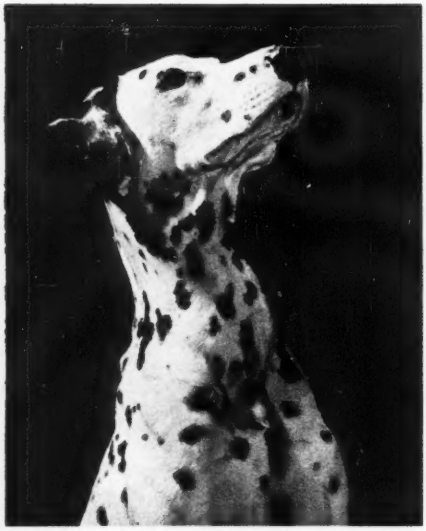
2. To create a special effect before the image reaches the film or paper.

Under the first heading we may include the following:

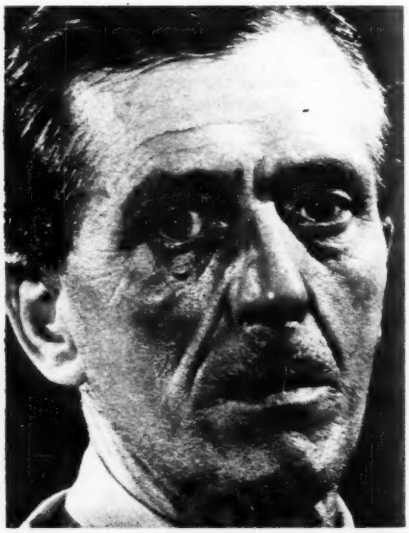
The image that is partly out of focus. Although it

[*Continued on page* 154]

Below: Diffusion is definitely out of order when making animal pictures as the texture of the subject's coat is one of the features to capture.



Character studies are often helped by a straightforward reproduction of the subject. As Oliver Cromwell said, "Paint me with my pimples."



TEST STRIP TECHNIQUE

BY A. J. LOCKREY

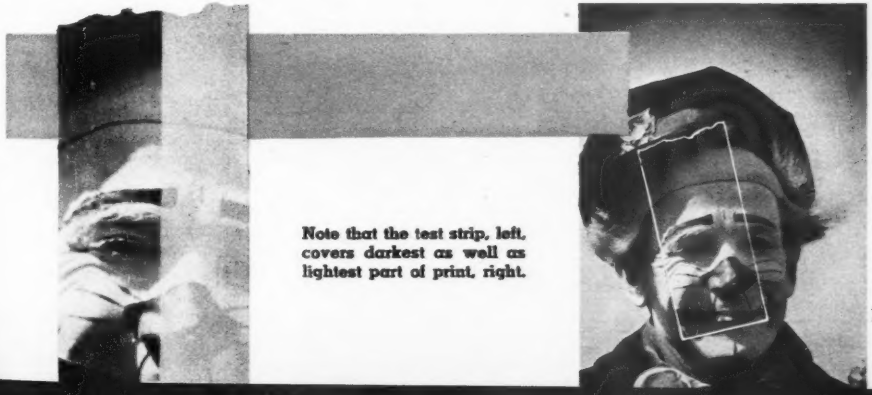
Result of a 10-second exposure. Image is gray and lacks snap.

Perfect negatives do not necessarily yield good prints—unless you use test strips.

EVERYBODY makes test strips when making enlargements. But, very few workers get the full benefits out of this step. The usual method with most photographers is to expose a narrow strip of paper at one end and progressively increase the exposure at about 5-second intervals.

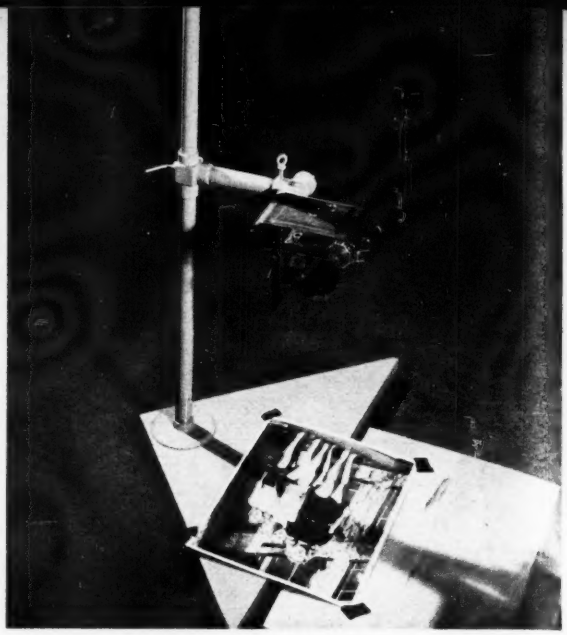
A better technique is to place the test strip, as shown at the bottom of page, over an area of the print that contains the darkest shadow as well as the lightest highlight. Then, expose the test strip *laterally*. This way your test strip will show the effects of different exposures on the light and dark parts of the print, instead of only at some intermediate point. •

Darker print obtained when paper was exposed for 20 seconds.



Note that the test strip, left, covers darkest as well as lightest part of print, right.

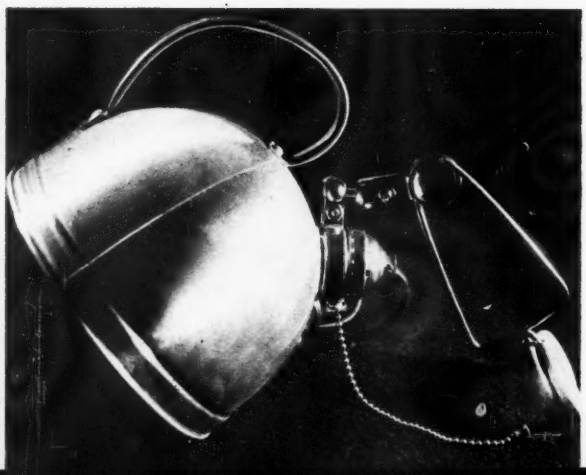
photo kinks



Copy Stand. A length of ½ in. pipe, a 6 in. nipple, two T's, a flange and a wooden baseboard are all you will need to make this stand. Ream out the threads on one T so that it will slide loosely on the upright. It is locked in place by means of a bolt bent at a slight angle. Second T engages camera by means of a ¼x20 bolt.

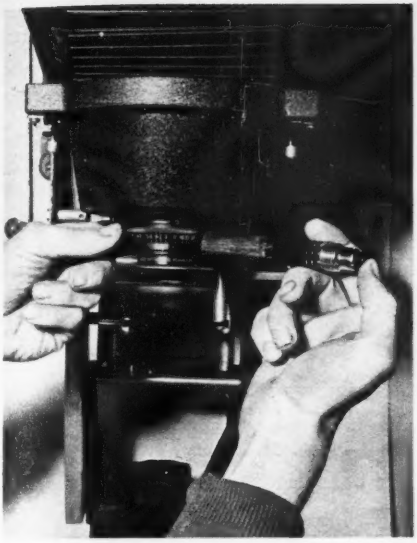
Darkroom Towels. Ever get into an argument as to what towels belong in the darkroom? Mark them and avoid back talk.

Make a stencil out of a wood block and letters cut out of an inner tube. Glue them to the wood block and then apply an indelible laundry ink. Press the stamp into the towels and presto, the dirty deed is done. Hold the stamp down firmly for a few seconds to allow ink to soak into the cloth.

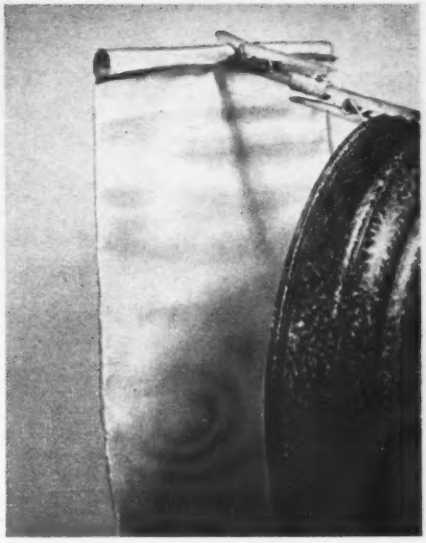


Teakettle Light. After your whistling teakettle has uttered its last toot, don't discard it. It can be converted into a mighty handy photoflood unit for indoor work.

Remove the bottom and install a pull chain socket as shown in the photograph at left. Notice how the collar of spring clamp engages the neck of the kettle. Use some tape to insure a tight fit. Line with tinfoil.



Darkroom Light. Most workers focus their enlarger on the easel with the lens wide open. Closing down to the desired opening is a problem unless you arm yourself with a small pen light. See above.



Diffusion. For portraiture, a diffused photoflood is easier on the subject's eyes and yields better gradations. Use a square piece of silk nailed to a dowel and clipped to the reflector with two clothespins.

Tray Identification. A sure method of avoiding a developer and hypo mix-up is to cement and emboss a D and H at the end of each respective tray. Letters can be traced with the fingers in the dark. Waterproof adhesive tape is good protection.

QUESTION BOX

By Robert Brightman

What is a "Recomar" camera? Rafael Bagu Alers, Mayaguez, P. R.

The Recomar camera was manufactured in Germany by the Eastman Kodak Company. Two styles were made; one took a picture 2¼x3¼ in. and the other 3¼x4¼ in. Both cameras had a double extension bellows and used film pack or cut film. They had a rising front and were equipped with a Compur shutter with speeds from one second to 1/200th of a second. The smaller model sold for $54.00, whereas the larger one retailed at $63.00.

Can I take time exposures with regular household electric lamps? Paul E. Smith, Jr., Sweetsers, Ind.

Time exposures with house lamps can be calculated by means of a special Kodaguide published by the Eastman Kodak Co., Rochester, N. Y.

What caused the splotches on the enclosed negative? John Cox, Etiwanda, Cal.

The marks appear to have been caused by light fog. This is sometimes evident in "expired" film. Are we right in assuming that this film was used long past the expiration date?

Are my Universal Meteor and Beau Brownie cameras made to take color snapshots? George Kolar, La Grange Park, Ill.

They can accept color film, but, frankly speaking, we do not advise it as the lenses on these cameras are not corrected for color work.

Can I use infrared film in my Brownie Reflex with "blackout" bulbs? Jerry Jarnick, Almond, Wisc.

Yes.

Can I use my Kodak No. 1-A for taking flash pictures with a hand gun? J. Foster, Wolcott, Ind.

Place the camera upon a solid support. Open the shutter, set off the flash bulb and then close the shutter. If you use a Press 40 or equivalent lamp and the subject is about 10 ft. from the camera, use the smallest opening on the shutter.

Playtime ROCKING HORSE

A young man's best friend is his rocking horse. This one's completely housebroken.

BY RAY LIGOCKI

WHOA, Podner! A child's best friend is his rocking horse. It can be had pretty easy, too. Thousands of miles of travel in just one spot and not a cent of overhead, not even for hay or oats. Just pick out a few leftover pieces of ¾ in. plywood and mark them off to shape from the squares in the drawing.

Starting from top to bottom, the body will take a piece of plywood about 22½x16 in. After the squares are marked, draw the lines for the head, heavy enough so that the impression will show through the first coat of paint. Note that the top of the body is cut out at the back for the seat. Bore a hole for a ¾ in. dowel to be used as handlebars.

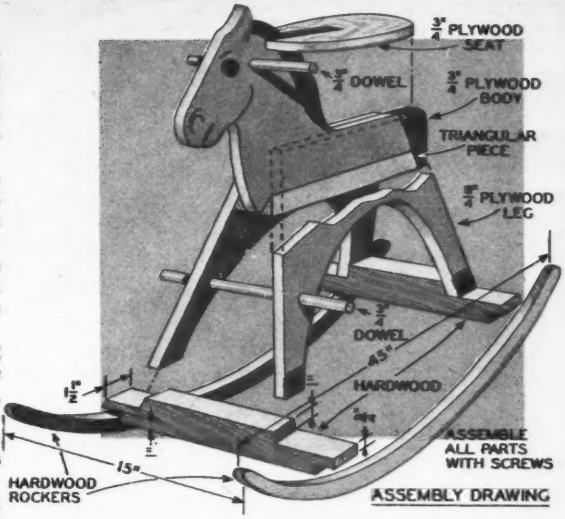
The plywood for the seat takes a piece about 15x7½ in. It is notched at the front to slip over the sides of the body. The seat rests on the two leg pieces of plywood, each about 25x15 in. The slant of the leg pieces need not be taken into account when marking off in squares, except that on the inner side, the leg pieces should be planed down at a bevel to fit flat against the body piece. A triangular piece is added below this bevel on each side to keep the body piece rigidly upright. Holes for the dowel used as a footrest may be bored later, after the horse is assembled.

The leg boards are fastened upon two blocks of wood 1½x2¾x15 in. shaped to spread them to the proper slant. These blocks are fastened with screws to the rockers.

The rockers are cut out from two pieces of hardwood 1⅛x7½x45 in. In order to make both rockers uniform and assure an even movement of the horse, it is best to clamp the two rockers together in a vise while bringing them into their final shape.

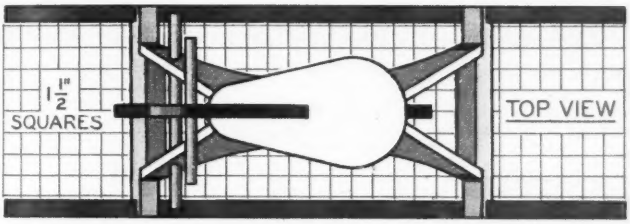
In the photograph the rocking horse was enameled white. The "look," mane, tail, hoofs, runners, and hand and foot rests are enameled black. Dimensions as given are satisfactory for youngsters from 2 to 5 years.

While this project can be best handled with a band saw, it should cause you no difficulty if you possess nothing more elaborate than a coping saw and a straight cross-cut saw. Get your youngster interested in his horse while it is still in the embryo stage of miscellaneous pieces of wood. If you ask his advice as to what kind of colors he wants his horse to exhibit, he (or she) will show a much more interest in the welfare of this bronco.

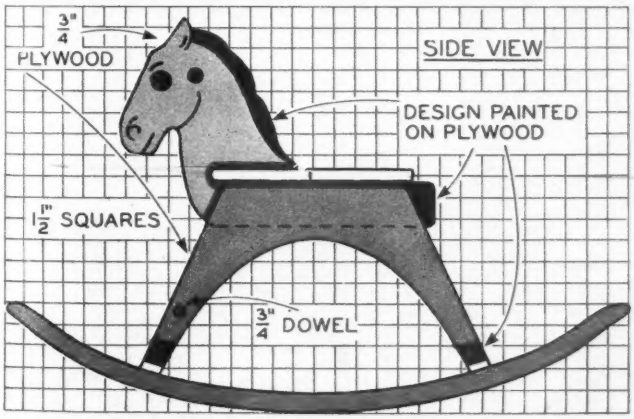


ASSEMBLY DRAWING

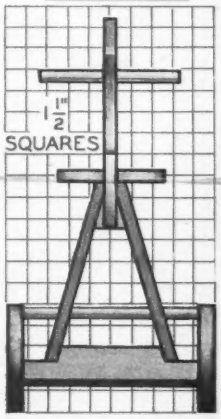
As mentioned in the preceding paragraph, the only critical part of the horse is the rocker assembly. The two rockers should be cut as part of a perfect arc in order to assure their uniform contact with the ground or floor. Bevel the edges, especially the bottom edges so that splintering will be eliminated. •



Dimensions given for this horse will suit youngsters from two to five years of age.



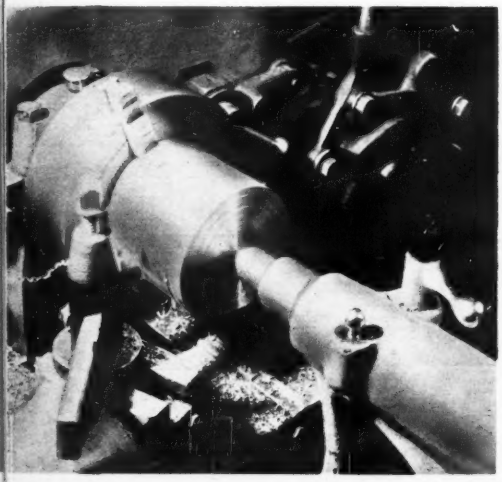
FRONT VIEW

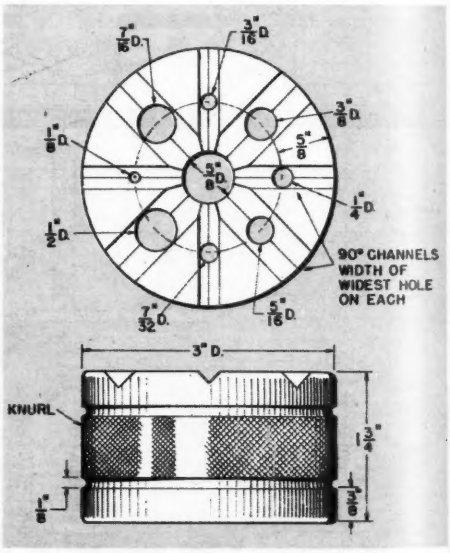


BENCH BLOCK

Turn the block to size between tailstock center and chuck, below; then drill the center hole and knurl, using a good tool and plenty of oil. Hold work in drill-press vise, above, for other holes.

USED when driving or removing metal pins, dowels, rivets, etc., this bench block has one flush side for flat work and one channeled side for round work. It's a simple project for the shop equipped with a lathe and a drill press. Machine it from tool steel; then harden by heating to a cherry red and allowing to cool in the air. The drawing gives all the dimensions. First, center-drill the steel on both ends so it can be held between centers on the lathe. Face the ends and turn the piece to size; then knurl to provide a gripping surface. The center hole is drilled while the block is mounted in the lathe; the others, on a drill press, countersinking slightly. The channels may be cut by any method for which equipment is available—on a lathe milling attachment, on a grinder, or even by hand.—*Will Thomas.*





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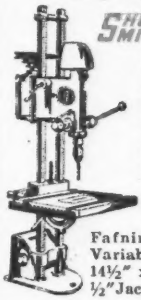
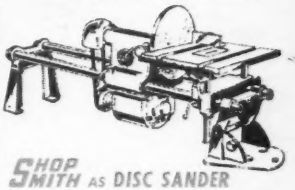


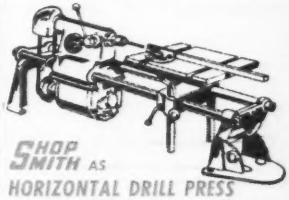
SHOPSMITH AS VERTICAL DRILL PRESS

Capacity: Drills to center of 15" circle. Clearance: Table to chuck—27" max. Spindle: ⅝" Dia., 6 spline, hardened tip. Spindle Feed: 4¼". 4 grease-sealed Fafnir ball bearings. Variable speeds. Table: 14½" x 17". *Equipment:* ½" Jacobs key chuck. Fence.



SHOPSMITH AS DISC SANDER

Disc Diameter: 12". Table Dimensions: 14½" x 17". Tilting Table. *Equipment:* 12" disc. Mitre gauge.



SHOPSMITH AS HORIZONTAL DRILL PRESS

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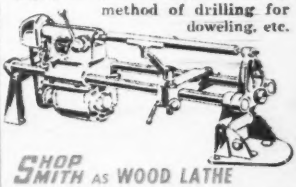

SHOPSMITH AS WOOD LATHE

34" between centers. Swing: 15". Variable speeds. Quill Feed: 4¼". Equipment: Tool rest. Drive center. Dead center.

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MI's Six-Inch Telescope

[*Continued from page* 109]

were using a camera. Shim up the mirror or twist it slightly from side to side as necessary in order to bring the reflected light to a convenient point for viewing. After the image of the lamp has been picked up, cover the lamp with the sleeve so that the pin-hole faces the mirror. This may disturb the setting somewhat and again you will have to explore the immediate area until the pin-point of light is picked up.

Since you will have to repeat this procedure during the stages of polishing, it is best to make some sort of reference mark on the table where the mirror is standing in order that it will always be brought back to the same position. As a further check, note where the image of the lamp is reflected to the opposite wall with the cover off the lamp stand. This way you can place the mirror so that the image always falls on the same spot. Then replace the lamp cover and you will be reasonably certain that the reflected pin-hole of light is about where it should be.

Now for the actual test. As the pin-point of light enters the eye, the mirror will appear as though it were luminous, glowing with light. Now then, carefully slide the knife-edge in toward the right (toward the lamp). Do this very slowly and carefully. As you do so, a vertical shadow appears to cross the face of the mirror. This shadow will move from left to right (the same way that you are moving the knife-edge *if the knife-edge is before the focal point.* If you move the knife-edge back an inch or two, the shadow will then appear to move from right to left. We are then beyond the focal point. As the artillerists say, "We have bracketed the target." Move the knife-edge back and forth until at a certain point you will notice that the mirror darkens evenly all over, as shown on page 109. There is no apparent movement of a shadow either way. This is the shadowgraph of a spherical concave surface.

We can consider rays of light going from the pin-hole and coming back from the mirror as giant radii. It is axiomatic that all parts of a sphere are equally distant from the center. Therefore, if we cut off half the light rays, at the center, then we shall lose half the illumination; hence, the sphere seems to darken evenly all over. At this point, we could probably go ahead and use the mirror but, if we want perfection, we should turn the mirror into a paraboloid, for a paraboloid will reflect *all light coming from infinity to a point;* a sphere reflects all light to a point when only the light emanates from the center of curvature.

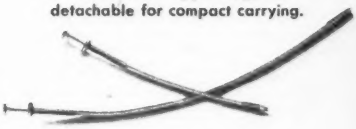
To parabolize our sphere, we will have to

[*Continued on page* 150]

KODAK TURN-TILT TRIPOD HEAD—permits fast aiming with still and movie cameras. Has multiple-disk felt friction clutches for smooth, easy panning.

KODAK TABLE TOP TRIPOD—makes table-top photography real fun. Elevates camera to convenient level. 8½-inch rubber-tipped legs are detachable for compact carrying.

KODAK EYE-LEVEL TRIPOD (*right*) sturdily built to last for years . . . designed for fast set-up. Adjusts from 2 to 5 feet in height. A simple twist locks legs at any extension. Weighs only 2 pounds—folded, it measures 22½ inches. Spur points of the legs give firm surface grip—removable rubber tips included for indoor work.



KODAK METAL CABLE RELEASES—eliminate danger of jarring camera when tripping shutter. 7-inch and 12-inch sizes to fit practically any camera.

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KODAK TILT-A-POD—on your tripod it permits tilting either movie or still camera. Quick-locking screw prevents slipping after adjustment.

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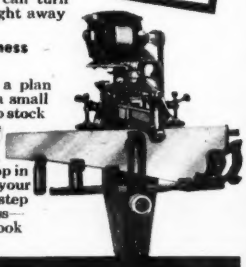

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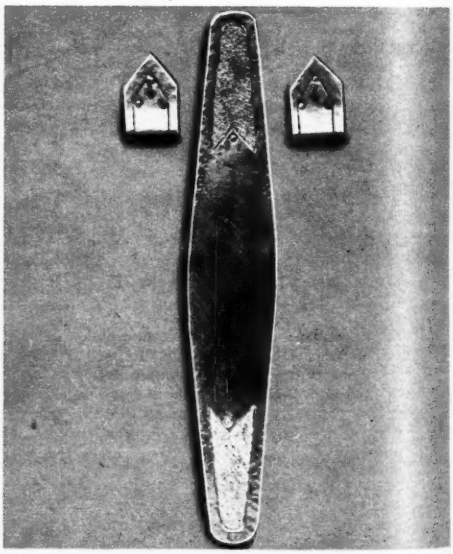
FOR the craftsman who likes to make jewelry, the wristwatch band illustrated offers unlimited possibilities, not only in making a beautiful piece for personal use, but also in opening up a new field for the worker who would like to produce something worthwhile for profit.

It is not difficult to make the watch band, or bracelet. All that is needed is a small

Below: The finished band and the two mounting clips. This is an ideal project for the person who wants to sell his handiwork to individuals or stores.



WATCH BAND

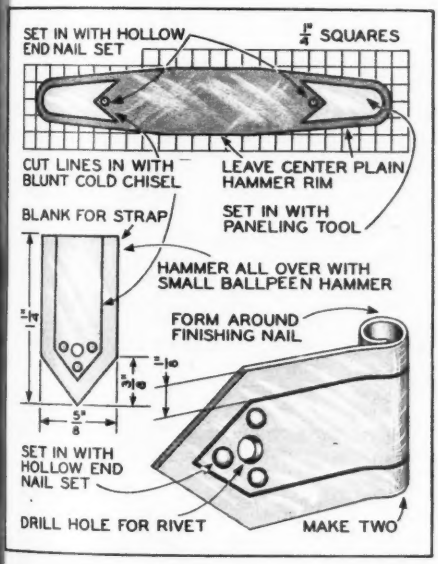
piece of No. 20 gage German silver. This metal is an alloy consisting of 50% copper, 20% zinc and 30% nickel.

Cut the blanks as illustrated, then tool as shown in the drawing. The paneling tool may be made in a few moments. Anneal any old punch. Grind the end off square, then, using a cold chisel and a center punch, cut the end of the punch up alternately with the two tools as much as possible. Unless the punch is to become a permanent tool, it will not be necessary to reharden it for this simple job.

Bend the band to fit the wrist, then, after forming the two short straps to conform with the lines of the band, drill the rivet holes in each. Now, place the watch in position, adjust the straps and drill corresponding holes in the band.

If German silver rivets are not available, use nickel-plated brass pins and rivet them on the inside. Set the watch in place and pass the pins through to complete the band.

German silver is an excellent material from which to make jewelry, as the metal does not tarnish as readily as silver, and it is much more durable. •



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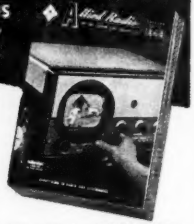

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MAKE METAL PROJECTS with CHROMTRIM

MI's Six-Inch Telescope

[*Continued from page* 146]

deepen the center a few millionths of an inch. This sounds terrifying but it is quite easy to do. Cut two masks out of light cardboard as indicated in the drawing. With mask No. 1 we will determine the exact focal point of the outer portion of the mirror. Mask No. 2 will help us determine the focal point of the central area of the mirror. There should be a difference of 1/12th of an inch between each area.

How shall we achieve this? If we increase our polishing stroke to about 3 in. instead of the previously used 2 in. stroke, we shall rapidly deepen the central part of the mirror. Use this stroke for not more than three minutes and then test.

Place mask No. 1 over the mirror and carefully determine where the outer portion of the mirror (as seen through the two cutouts) darkens. Then use mask No. 2 and do the same thing for the central area of the mirror. You will find that you will have to push the knife-edge nearer the mirror in order to cause the central area to darken uniformly. This is because the central area has a shorter radius of curvature. The exact difference should show the shadowgraph of a paraboloid If you test the mirror, without any masks it should show the shadowgraph of a paraboloid illustrated on page 109. Notice that the half moon shadow on the left is complemented by a light area on the right and that the light area of the inner portion is complemented by a corresponding shadow on the right. The next step is to aluminize the mirror. This can be done commercially and should cost you about $2.50. Next month we will tell you how to complete the telescope. •

Window Cornices

[*Continued from page* 101]

cut the Masonite accurately so that the completed box fits snugly over the top of the frame. A couple of wood screws through the top piece hold the cornice in place.

All sorts of designs are of course possible for the front piece. Take a tip and don't make them too fancy. I started with the double curleycue shown in the bottom half of the close-up picture, but discarded this in favor of the simple scallop. The pattern for the latter was merely the cover of a paint can! Plot the pattern carefully in pencil and make sure it comes out even. Masonite cuts easily and the sawing is quickly done.

Only the front and the two small sides need to be painted. The top is not visible from eye level. Go easy on the color. If too bright a shade is used, the cornices look like gashes across the wall.—*Robert Hertzberg.*

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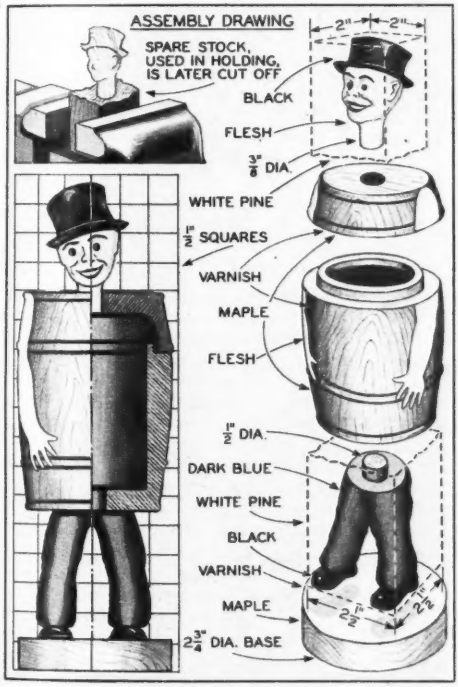
Use white pine for the carved head and legs, leaving the stock sufficiently long so it can be clamped in a vise while it is carved. This extra material is easily sawed off later. Rough each piece to shape, then carve details with a small veining chisel. Saw off the extra stock, sand, and lay aside for enameling later.

For the barrel and base, any available turning wood, such as maple, is acceptable. They are both turned from one piece. The procedure is to mount the stock between centers, turn down to 2¾ in. in diameter, and cut off a ⅝-in. piece for the base. Then, with the remaining stock mounted on the live center, use tailstock and hand turning tools or slide-rest bits to remove as much of interior of barrel as possible. With care, a center rest will not be necessary. Complete the barrel by turning down the exterior, sanding, cutting off, and boring the tenon hole. The barrelhead is made in the same manner, without the need for the tailstock.

Apply a prime coat of shellac and finish with varnish and enamel; then assemble with glue.—*Bruce MacIntosh.*

Cigarette Bin



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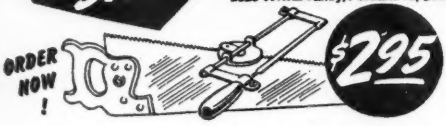

To Diffuse . . .

[*Continued from page* 138]

must be stressed that the terms *out-of-focus* and *diffusion* are definitely not interchangeable, there are frequent occasions when slight unsharpness in an area of secondary importance can be minimized and made practically uniform in quality with the sharply focused areas simply by diffusing the entire image.

Image graininess. Of course, we know that nobody has grain trouble any more—ahem!—but, just in case, diffusion is one way of doing away with it in the print. Naturally, the printed image will be softer in outline than it would be were diffusion not used, but the soft "grainless" image is preferable to the relatively sharp grainy result.

The contrasty negative. The usual remedy is a soft paper, but diffusion is another which, in addition, will smooth out the scale when even the softest paper is not quite soft enough.

The retouched negative. The highest praise a retoucher can receive is to say that negatives retouched by him can be printed "straight," that is, without diffusion to soften, and eliminate where possible, all the telltale retouching strokes. However, not all retouchers are this skillful and diffusion must frequently be resorted to.

Diffusion may also be introduced when a mood of a certain quality is wanted. Diffusion may be used to heighten perspective in landscape and other pictorial work. Knife-sharp skin faults, hard ridges and lines due to age and other details usually exaggerated in a print, are frequently diffused very effectively. For special effects, however, photographers often shun diffusion, preferring what they call the realistic touch. It is all a matter of individual interpretation, preference, viewpoint—call it what you will.

Basically, methods of diffusion are threefold:

First, *diffusion at the source.* We can use long-scale film material and, by developing it in a soft-working solution, obtain a much more extended range of values (the total effect of which is in some respects similar to diffusion) than we could with average emulsions. So-called "portrait" and "soft gradation" emulsions are available for just this purpose. In this connection, too, the use of soft portrait papers will produce the desired results without further manipulation.

Secondly, there is *diffusion in the camera.* This takes in the various methods, aside from film choice, that may be employed in projecting a diffused image directly onto the exposed film. You may diffuse the camera image by choice of illumination, by the use

. . . or Not to Diffuse

of diffusing material in front of the lens, or by the use of a lens designed to produce soft images. A light with a screen in front of it will spread its rays more evenly than will that same light source minus the screen, with the result that the light becomes more diffuse, or softer. A floodlight will give a softer image than will a spotlight. Fluorescent illumination is extensively used in portraiture because of its soft quality. Outdoors by sunlight, we choose the early morning or late afternoon when we want our pictures to have a soft appearance.

The story goes that one photographer was so much sold on the beauties of diffusion that he deliberately scratched lines on his lens to make certain that all his images would thenceforth be diffused. It would have been a simpler matter to slip a diffusing disk over the lens to get the same effect. Such disks are available in a number of types, giving more or less diffusion as desired. You can make one yourself by scratching fine criss-cross lines on glass or stretching a piece of cloth over a holder designed to fit on the lens barrel. Or, if your camera is of the view or other type permitting interchange of lens boards and lenses, you can use a simple spectacle lens or an inexpensive portrait lens.

Thirdly, we have *diffusion in printing or enlarging.* A sharp negative image printed by contact, emulsion side to emulsion side, on smooth paper under effective pressure, such as an efficient printing frame, can produce the sharpest possible print from that negative, barring processing errors. By interposing a screen between the negative and the sensitized paper, you can obtain satisfactory diffusion.

However, except for professionals, the majority of today's photographers make practically all prints by enlargement. Enlargement automatically is a step toward diffusion and by comparison with contact printing, is bound to produce a less sharp image. This diminution in critical sharpness, moreover, will proceed, in general practice, much more rapidly with miniature negatives, which must be enlarged several diameters, than with larger negatives from which fair sized prints are obtained by enlarging from 2 to 4 diameters. In addition, the type of enlarger is a factor in diffusion. The condenser type enlarger is an aid to sharpness; the diffusion type, which employs ground glass and opal to spread light, produces a softer print.

We can also resort to the use of diffusing screens placed over the enlarging lens or some distance away. It is better to shoot a sharp negative and employ diffusion in making the enlargement just in case the occasion arises when a sharp print may be needed. •

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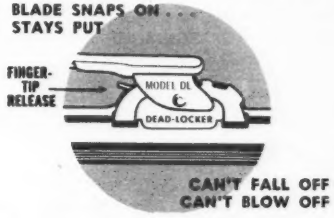

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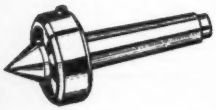

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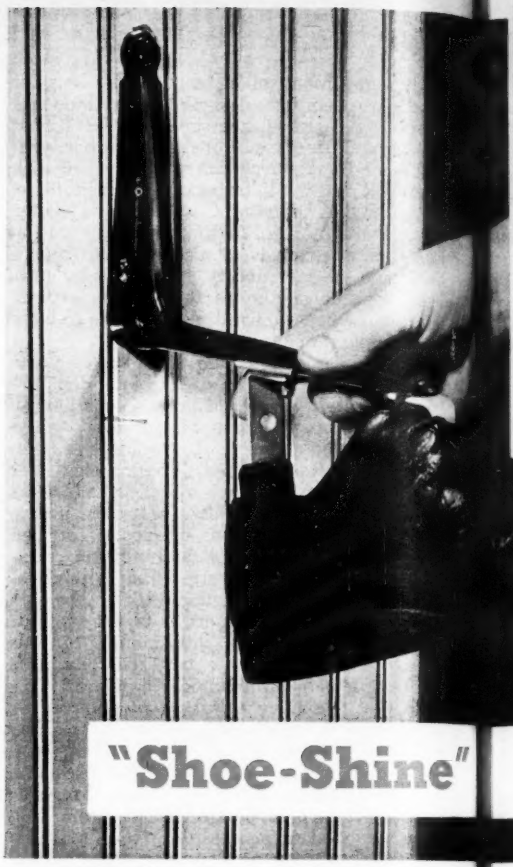
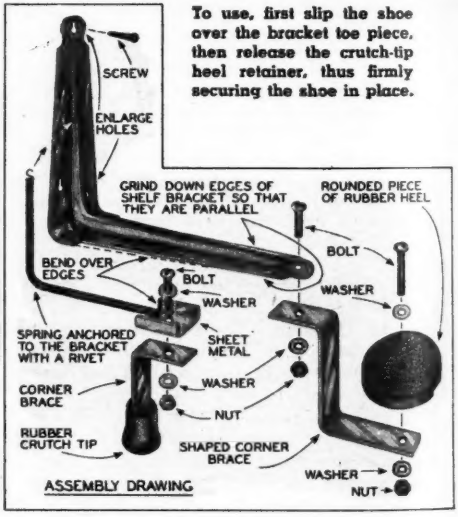
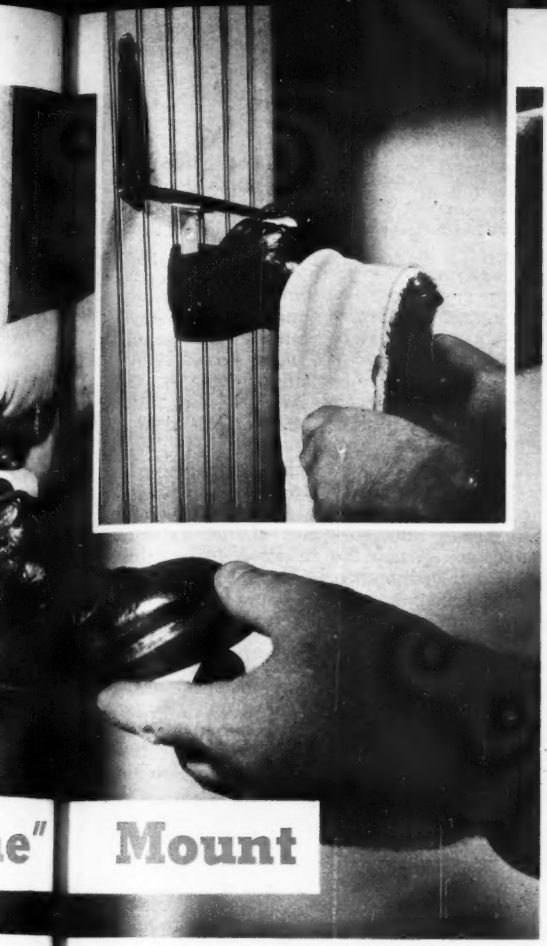


"Shoe-Shine"



To use, first slip the shoe over the bracket toe piece, then release the crutch-tip heel retainer, thus firmly securing the shoe in place.



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Build Chessy

[*Continued from page* 123]

chines have been nailed and clinched their full length, saw off the aft end so they will butt against the transom. Now, nail through the sides into the transom.

Turn the boat over and fair up the bottom edges to take the bottom planking. Notch into the stem for the bottom planks, as shown. Put on the bottom, nailing into the chines and sides alternately, butting the bottom planks up against each other "hand tight," and using strips of candlewicking in the joints between the sides and bottom. The method of assembling the keel and skeg is self-explanatory.

Now, turn the boat rightside up and nail in the keel batten, stopping it ½ in. short of the stem and transom and beveling as shown. Seat risers and gunwales should then be nailed on. Fasten the gunwales from inside. Next, nail in the sheer clamps, breast hooks, and transom knees. Secure filler blocks underneath the rowlock chocks. Complete by installing the seats.

If an outboard motor is to be used, notch the stern so the wheel is sufficiently below the bottom of the boat to be in unobstructed water. A ½-in. bow line, fastened into the stem as shown, will always keep her bow from fouling when the boat is tied to the dock or is being towed.

Sink the heads of all fastenings below the surface of the wood. For smoothing up the hull, you can't beat a sanding machine; so try to borrow or rent one for a few hours. Finish the entire hull with a coat of primer; then strike in a waterline 1½ in. above the actual line of flotation and apply two coats of antifouling paint below the line and two coats of semigloss above it. Add a pair of No. 1 rowlocks and a pair of 7-ft. oars and you're ready to go. •

I Shoot Wild Animals At Night

[*Continued from page* 71]

for me, raking the back of my head. I found young birds in the nest, which meant that it was just right for photography. Eventually I reached the ground, a sorry spectacle, but all set to build a blind in a nearby tree. From that vantage point I spent 17 days studying and photographing this fierce, noble bird of the deep forests.

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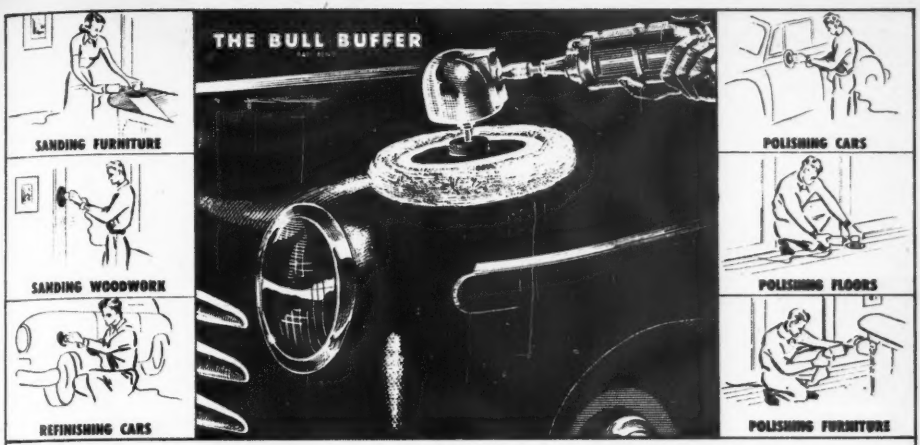

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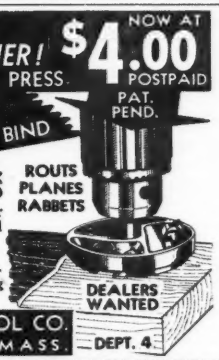

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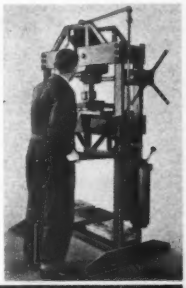

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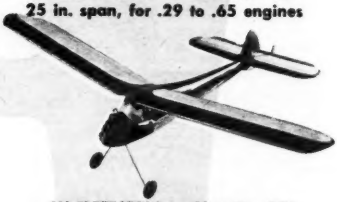

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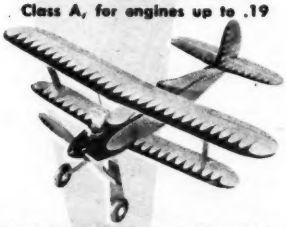

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How It Feels To Drown

[*Continued from page* 59]

must have looked pretty scared and silly when I scrambled up to the surface after brushing against those weeds.

Then I saw the hound swimming toward me. Maybe he only wanted to play. I didn't wait to see. When I was a kid, a frightened dog in the water clawed my back badly and nearly drowned me before I could get away. I didn't want that to happen again.

I swam away from the hound, out toward deeper water. When I looked around a moment later, the dog was paddling back to shore. I stretched out and floated lazily. I felt a strange twinge of uneasiness. I was alone in deep water, far from shore—too far. But the pond sparkling in the sun didn't *look* dangerous. What could happen to me? Cramps? No fear of that. We had been careful not to go in swimming until two hours after lunch. But still that curious feeling of apprehension persisted.

I floated into a patch of water so cold I shuddered and nearly cried out. An underwater spring. The current of ice water, gushing out of the blackness beneath me, made my heart jump. I struck out quickly for safer water.

Water smarted in my nose. My body tensed and I stroked harder. A sharp pain in my nose and eyes pierced the back of my neck and shot over the top of my head.

Take it easy . . . you're going to be all right. No cramps, no sinking—just a little neuralgia, probably, like when you eat ice cream too fast. You know what you're doing—you're swimming for shore. Keep calm . . . take it easy.

I cringed as another gush of cold water swept over me. Something long and slimy caught in my fingers. Probably only a weed—I shook it off with a wild fling of my hand and kicked out furiously.

I had to get back to land—warm *solid* land. I lifted my head for a quick look at the shore. Ought to be straight ahead. No, it couldn't be that far. There, over to the side, was the diving board. In my frantic paddling, I had turned and was *paralleling* the nearest shore instead of heading for it.

Call for help? . . . No, I was all right. Scared for a moment. But now I knew where I was. Nothing *really* to worry about.

Drown? On a nice sunny day—in this smooth millpond water? Nuts!

Again I headed toward the shore. I felt a little better. Confident. Sure of myself . . . almost. And then, as I rolled my head to breathe, I inhaled water. A big mouthful of it.

Every swimmer inhales a little water now and then. A cough, a splutter—it should have meant nothing at all. But I was tired and jumpy.

[*Continued on page* 163]

NEW *Electric* SANDER

Amazing

MOTO-SANDER AND POLISHER

Saves Time-Saves Effort! Dremel has developed a combination electric Sander and Polisher for home or shop . . . so easy to handle that a child can use it. New, inexpensive "Moto-Sander" delivers about 7,200 strokes a minute. (Short, rapid stroke frees dust from sandpaper . . . makes paper last longer). Moto-Sander does a magically smooth job of sanding . . . gets into places other sanders can't reach. Rubber cushioned sanding pad measures 2¼"x3¼". Cam-type-clamp paper holder permits changing sandpaper in seconds. Moto-Sander has only two moving parts . . . never needs oiling or adjustment . . . weighs only 2½ lbs. Uses 110-120 volt, 60 cycle A.C. electric current (only). Gives no radio interference. Comes with 8 ft. (Underwriters' Approved) rubber cord plus 6 sheets assorted grade Garnet paper, plus ⅛" thick felt pad and sheepskin for wax polishing.

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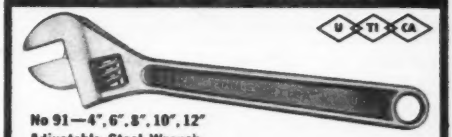

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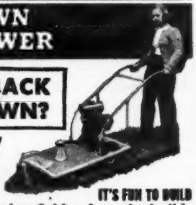

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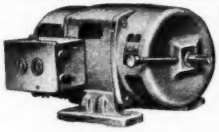

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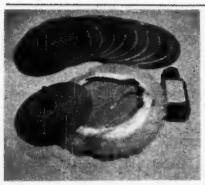

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How It Feels To Drown

[*Continued from page* 161]

I gagged on the water. In an instant my confidence was gone. In its place was . . . panic. And fear. I didn't want to die. I lashed out and I struggled desperately to swim . . . to stay afloat . . .to stay alive.

My eyes, wide open, searched for the shore. But there was only blackness. I screamed.

No one heard me. For I was screaming against a solid wall of water. I was below the surface. I had always heard that when a man is drowning the events of his life swim before his eyes, like a movie. Not for me, they didn't. I was drowning. But there was no melodrama. No pictures. Only the thought. . . . I'm not dying. I'm not. . . I'm not. I refused to believe I was dying. And yet I was.

A blazing light flashed full in my face. I was staring at the sun. It paled, turned a filmy yellow, then green. I was sinking away from the light. I thrashed frantically toward it, gasped for air. Water . . . tight walls of water.

The surface again. Scream for help? No, not yet. What'll Herb think? Don't be a weakling. Don't scream—you're all right.

I didn't scream. But I wasn't all right. I was trying to swim up. But where was up? I was going down . . . down and around. The pressure of the water drummed against my ears.

My hands clawed into mud. It was shiver-cold and the heavy-oozing mud was blocking me from the warm sun. I kept digging into the mud, fighting to get through to the sun. I raked at the mud in frenzy, kicking it, mauling it with my fist. I opened my eyes. Everything was still black.

Maybe I could drown. What would Dad think? He was working hard to make me a good lawyer. I couldn't do this to him. Mother had died a few years before—he'd be lost without me.

Why did Herb butt into my life, make me come swimming? Damn him! All his fault I was drowning out here in Sutton's pond.

Suddenly I was sorry for Herb. He'd have to tell Dad I died at the bottom of the pond.

Again, that blazing light. Strange—I was on the surface. But there was nothing secure about it. The surface was just a brighter color in a world of water. Top or bottom of this world, I'd still drown.

Do you go down three times before you drown? I don't know. You rise, you sink, you spin around. It's all the same—all one same world of panic. Another spasm of frenzy lashed me. No thought—only brain-numbing fear. My eyes were wide open. My arms flailed white swaths of foam in the dark water.

Then a curious thing happened. Panic left me and I was thinking again—conscious of living. I thought, no one was home to cook

[*Continued on page* 164]

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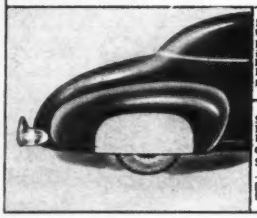

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How It Feels To Drown

[*Continued from page* 163]

my lunch today so I cooked it for myself. Eggs. Scorched eggs. What a last meal for a dying man, I thought—scorched eggs! Shabby way to treat myself the very day I die.

A sudden pang hit me. Not only was I going to die—I was actually doing it. In a few seconds, I'd be dead. Afraid? I wasn't afraid—I was furious with rage. Dying. . . I was going to be dead, cold dead on the slimy bottom of Sutton's Pond. I tried to hit something, anything, to hurt myself, to prove I was alive. I felt no pain. Water must have poured into my lungs but I felt nothing. I screamed into the water. No sound.

Don't go any deeper. Cold, slimy weeds down there. Maybe big fish in the weeds. Somebody pulled a five-pound bass out of the deep water. Who? Fish blurred in my mind. Icy fish slithering through the creeping weeds. . . The panic exploded again.

Dark down there. Dead black . . . blackness and weeds. Wild, slashing fear . . . then darkness—deep, bottomless darkness.

It was all over. I was dead and there was nothing any more. Nothing at all—but Death.

The darkness was not so black now. Vaguely I could see blurred, trembling patches of green. Was this death—just a wall of greenness? And what are those things—those black things that look like someone's shoes standing on green grass? Dirty, dust-streaked shoes under blue overalls?

I wanted to laugh but my chest hurt. How could I feel pain when I was dead? Something scratched my hands.

Dazed, I flickered my eyes. That strange greenness was grass—real grass. And those shoe-like objects were shoes—real shoes, worn by real, living people—a whole circle of people.

I was lying on a cushion from Herb's car. And I was hearing talk again—good talk. I made out the voice of Doc Weatherby.

"Got there just in time, Herb," he was saying. "Give him a chance now. He'll be all right."

I had gone from the world, drowned in the dark waters for one whole hour. I had journeyed into death and had come back from my drowning.

I have known what it feels like to drown. And I hope I shall never know that feeling again. •

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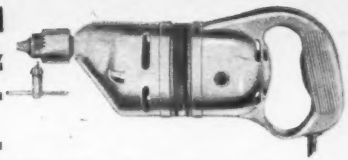

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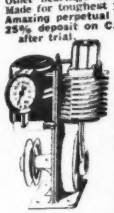

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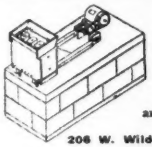

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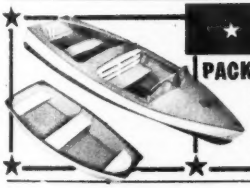

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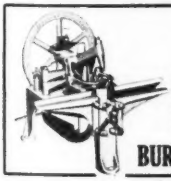

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Can Moon Increase Crops?

[*Continued from page 77*]

When Madame Kolisko tried the experiment with flowering plants, the results were very similar. The plants sown two days before the Full Moon flowered earlier, more abundantly and had a sweeter scent. Those at the New Moon were thin-stemmed and had fewer flowers. In the case of the larkspur, the seeds planted two days before Full Moon had an average of 15 flowering shoots, while those planted two days before the New Moon had only seven.

Despite the fact that Madame Kolisko has documented her work, there are many persons who doubt that a physical force such as moon-power has any effect upon our crops. They shake their heads at Madame Kolisko and smile at the introduction to her book about the moon experiments, "The Moon and the Growth of Plants." In her preface she says, "One will never be able to draw up a scheme of the cosmos without the aid of spiritual science; natural science can then arrive at an explanation of many inexplicable things." She hints at the need for recognizing the role of the supernatural in our lives.

Especially under attack are the list of exceptions which she drew up.

1. If the Full Moon effects are too strong, the crops may rot.
2. If the New Moon is too strong during the growth of the plant, it will result in a woody crop.
3. If the soil is dry at Full Moon, the forces of the moon cannot develop their effect. Water is the conducting medium which leads moon-power into the plants.

Doubters point out that these exceptions allow a great deal of leeway and can be used as an excuse for almost any variation from the theory. The need for moisture to conduct the moon-power has been cited as proof that the secret lies in simple irrigation rather than any mystic moon force. The limited number of experiments and Madame Kolisko's background of belief in the mystic have also been used as arguments against her. Disregarding these objections, Madame Kolisko is continuing her work at the Biological Institute in Bray-on-Thames, England.

But it may be that sometime in the future, scientific farmers will adopt moon-phase planting as a legitimate means of increasing crops. Certainly Madame Kolisko's experiments have not definitely solved the riddle of the effects of the moon on plant growth. Even she does not claim that. But she does believe that her experiments have been a solid step in the direction of general understanding of the vast forces of the moon. •

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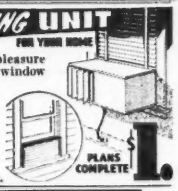

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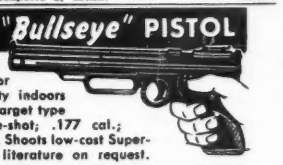

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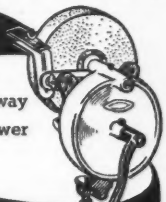

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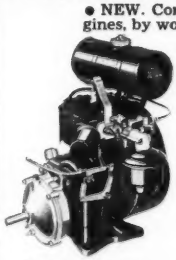

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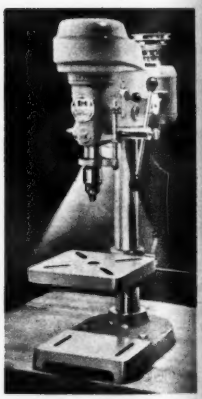

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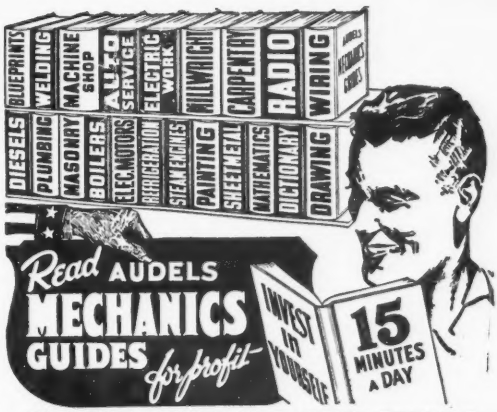

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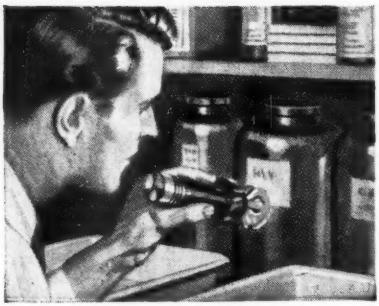

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